THE OLD TIMER'S BULLETIN

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Published for the Collector, Historian and Old Time Wireless Operator

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Bulletin material (except ads or book reviews); orders for the AWA Review or OTB back issues: Ludwell Sibley (Editor), 44 E. Main St., Flemington, NJ 08822-1224, (908) 782-4894.

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Financial reports: Dexter Deeley (Treasurer), 8 Briar Circle, Rochester, NY 14618.

(Please write legibly. Enclose an SASE for prompt reply.)

AWA NETS (EST)

PHONE:

Sun. 7247 kHz SSB, noon (NCS N4FS)
3867* kHz AM, 7 PM (NCS W2ICE)
Tues. 14274 kHz SSB, 2:30 PM (NCS varies)
3837* kHz SSB, 8 PM (NCS N4FS)
Mon.-Wed.-Fri. 3867* kHz, 9:30 AM (NCS W2AN/W2ICE)

CW:

Daily, 4 PM, 7050 kHz (NCS varies)
First Wed. of each month, 8 PM, 7050
* Go up 5 kHz if QRM is present.

2-M REPEATER (Rochester area):
Mon & Wed., 7:30 PM (NCS: W2ICE)
Receive 146.820; transmit 146.220

FROM THE EDITOR

Ludwell Sibley, KB2EVN

LOTS OF SCOTT

This issue presents, besides news of the Rochester conference, "mini-special" coverage on some little-known Scott receivers: the famous-but-rare Scott Special Communications Receiver, and the "morale receivers" that entertained sailors during WW II (and much later). This is the first extensive material known on either of these topics.

EHSHS OFF TO GOOD START

The E. H. Scott Historical Society is solidly founded, judging from their first quarterly, a professional-looking 8-pager (big format) with a well written biography of Scott. For membership, the contact is P. O. Box 1070, Niceville, FL 32588-1070. Dues are $20, January-to-January, prorated to the time of joining. The group has specific goals of technical aid for restoration of Scotts, by such means as Scott-specific want ads, and development of a formal collection of Scott sets and papers.

Now that Scott and Eddystone have their own collector groups (see "The Mailbag"), how soon will other make-specific clubs will turn up? AK Admirers? Hallicrafters Hallowers? Philco Fanciers? RCA Reverers? Seriously, today there are enough collectors of specific brands to make such a movement succeed. Witness the antique-car hobby, where major names (e. g., Hudson, Corvette) have dedicated national clubs.

KEG RADIOS

Bob Haworth has written up his oak-keg set in this issue. As more information, Jonathan Hill's Radio! Radio! depicts a 1935 Clarion "Old Lager" barrel set, US-made for the British market, and cites others through the late '50s: the "Radiokeg" (R. K. Radio Laboratories, Chicago, 1935, diagrammed in Rider's Vol. 4), the "Unique Beer-Barrel" (Unique Radio Ltd., Chadwell Heath, Essex, 1954), and the "Rum Barrel Novelty Radio" (Whitley & Holroyd Ltd. (Bradford, 1958).

CORRECTION

Television historian Albert Abramson points out, regarding David Kraeuter's "Famous Men of Radio and Their Not-So-Famous Inventions" (August OTB, pp. 24-25), that David Sarnoff was not literally a "founder" of RCA, being commercial manager of American Marconi at the time; *founding member*, perhaps. (Of course, Sarnoff in the Twenties shaped RCA into its ultimate form, but that's later.) Also, Vladimir Zworykin may have *encouraged* the invention of the image orthicon, thereby becoming *known for* it, but the actual invention was the work of Albert Rose, Paul K. Weimer, and Harold B. Law.

THE COVER

From the early Twenties, an advertising illustration for a typical French home receiver. Radio was no mass-market proposition in Europe at the time, hence the decidedly upper-class appearance of the family and its surroundings. A universal theme in advertising art, of course, was the program source, depicted mistily above the speaker: operatic performers, a symphonic orchestra, a jazz band, or even a baseball field. *Photo courtesy Eunice and Riccardo Kron.*

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The Museum ..... Rear Cover

AWA NEWS

CALENDAR

Nov. 1 - Annual AWA business meeting, Rochester, NY
Nov. 7 - CHRS Meet, Redwood City, CA
Nov. 13, 15 - 1929 QSO Party
Nov. 21 - AWA Meet, Bradenton, FL
May 1, '93 - Spring Meet, Bloomfield, NY

FLORIDA MEET - BRADENTON-TAMPA-ST. PETERSBURG

Saturday, Nov. 21

Meet, flea market, program, starting at 8:00 AM, at Stewart Elementary School, 7905 15th Ave., N. W., Bradenton. For more details, send an SASE or phone: Norm Smith, 7203 17th Ave., N. W., Bradenton, FL 34209, (813) 792-0003.

RARE-TUBE SALE

In our annual tube sale/auction of surplus or deaccessioned items from the Museum, the following tubes will be offered on a bid basis:

Electrad diode; Myers Audion; Westinghouse TB1; RCA 216B; Moorhead VT; Western Electric VT1, VT2, 102F, 215A, 216A, 217A, 205D; off-brand 201As, etc.

Send an SASE for a listing: Dex Deeley, 8 Briar Circle, Rochester, NY 14618.

NFWA/AWA JOINT MEET

Despite predictions of rain which didn't occur but probably reduced attendance, there was a good turnout for this August 15 meet, held annually by the Northwest Frontier Wireless Association at the Amherst Museum near Buffalo, NY. The emphasis was on the flea market, with collectors from as far away as Rhode Island, Virginia and Ohio. Most told me that they considered their trip well worth while; I found the rest of the 1919 *Radio News* issues needed to complete a collection of the first year of publication.

The NFWA had done a lot of advertising and attracted many new collectors to this meet. Sales were brisk and everyone enjoyed the donation auction, where many bargains were to be had. This helps support our club and the Museum.

There was a contest; I thought the nicest entry was in the homebrew crystal set category. Art Albion won it with his two-piece set in matching boxes with beautifully engraved bakelite front panels, labeled respectively "ALBION CRYSTAL SPECIAL, SERIAL NO. 1, NIAGARA FALLS, NY," and "ALBION ANTENNA TUNER, NIAGARA FALLS, NY." As always with things built by Art, they showed beautiful craftsmanship. Another first-prize entry was submitted by John Myers in the five-tube category: a three-knob TRF Kenman with all brass-based and -tipped tubes. Kenman Electric Co. was in business for about one year, 1925. The writer won the blue ribbon in the amateur receiver class with a Grebe CR-18 with a full set of coils and the instruction book.

Don Oldaway of NFWA brought his wife Nancy to help. They were collecting the $2 admission charge and later cooked hot dogs, etc., for those who stayed for lunch.

A plus this year was the NFWA's permanent exhibit in the museum. This revolving exhibit of members' artifacts is placed behind an antique radio storefront in the Hall of Communication. There is a typical 1920s' radio service bench with tools, test equipment, telephone, parts, and period calendar. The next window displays early RCA products, including the Radiola radios, and a dedication to one-time inventor Harry Houck for his contribution to the display. There is also a window of early Quaker Oats box crystal sets and one of radio products made locally by the Carborundum Corp. in the 1920s.

Plans are being made to make next year's meet even better. We hope to see you in August at the Amherst Museum. [Larry Babcock]

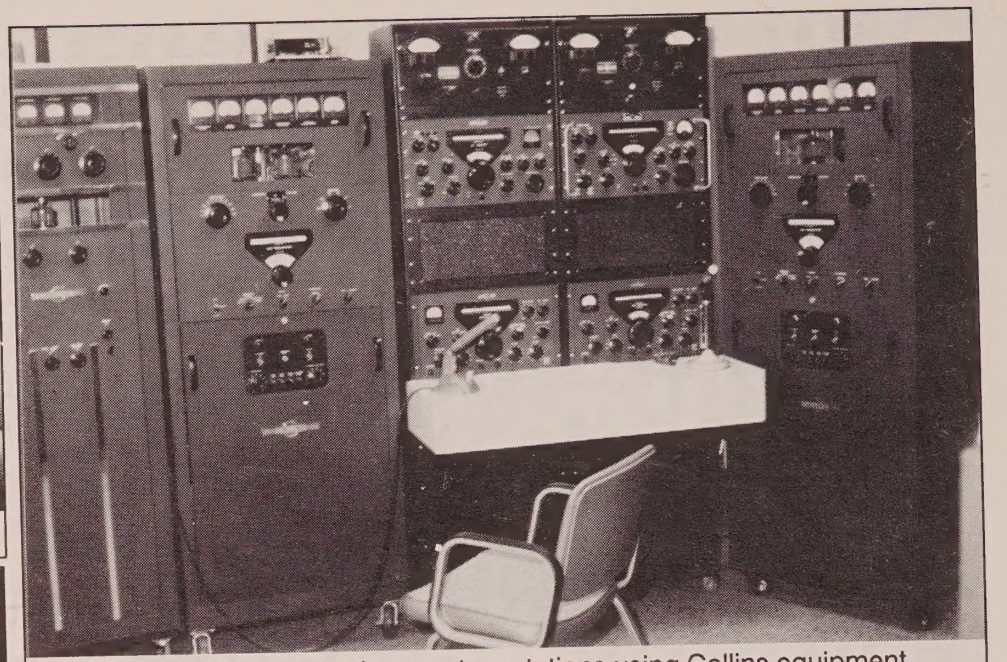
AWA CANADIAN SUMMER MEET

Once again, our Canadian representative Fred Hammond, VE3HC, played host to nearly 100 members from Ontario, Quebec, New York, and New Jersey. The scene was one of Fred's office buildings in Guelph, Ontario, where he houses one of the country's finest radio museums. Morning flea-market activity in the parking lot was followed by lunch in the building's dining room and ended with a tour of the museum.

Fred had enlarged the displays since I was there a few years ago, with additional material in all areas. I was impressed with the large quantity of amateur and commercial equipment in addition to broadcast receivers and speakers. To keep things lively, one could fire up a rotary spark gap transmitter or operate one of the two large Collins amateur stations. Through the center of the main room was a spectacular display of *lighted* transmitting tubes.

Some of the Rochester attenders had an additional treat when, on the return trip, they made a brief stop at local collector Scott Guthrie's home and found a house full of choice receivers ranging from Scotts to Catalins. A most successful meet. Thanks, Fred! [BK]

Our host Fred Hammond, VE3HC, and key historian Murray Willer, VE3FRX.



One of the two operating amateur stations using Collins equipment.

Jim Frederick, K2GBR, and Bro. Pat Dowd, W2GK, with the tube display.

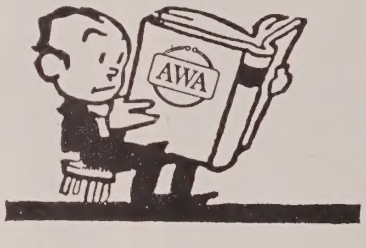
Bro. Pat appreciatively fine-tunes an HRO.

AWA REVIEW, VOL. 7, NOW AVAILABLE

The 1992 issue of the Review, introduced at the Conference, contains fresh and enjoyable historical material.

Leading off, Robert Lozier presents *Ricevitore Popolare Italiano* (The Italian People's Receiver): a family of sets promoted by the Fascist government in Italy during the '30s. These receivers and their political-social role are as interesting as the *Volksempfänger* series from Germany, but are little known - or found - outside Europe.

In "Memories of Early Electron-Tube Development," Edward Herold gives us a look into tube invention and design at RCA in the 1930s. RCA invested heavily and successfully in tube development, not just to sell advanced products itself, but to keep a strong patent position, drawing large licensing revenues from the rest of the tube industry.



Desmond Thackeray covers "The First High-Power Transmitter at Poldhu," analyzing the pioneering design of the high-power spark installation at Marconi's site in Cornwall, built (and rebuilt) for the 1901 first attempt to cross the Atlantic with wireless signals. There is nothing new about having to "debug" a new equipment design!

In "Secret Tubes for Radar," Ludwell Sibley discusses the role that the Western Electric 700-series played in WW II. These tubes, advanced and classified technology at the time, began affecting the course of the war almost exactly 50 years ago: in the Battle of Cape Esperance in the Solomon Islands late in 1942, WECo radars with 700A magnetrons and 701A pulsers helped give the Japanese Navy its "first defeat ever in a night action." An appendix by radar historian Colin MacKinnon covers Australian production and use of the VT90 (British prototype of the WECo 710A).

With his "Military Electronic Equipment - Naval Equipment Manufacturers," Fred Chesson provides a new reference source: a catalog of manufacturer-identification codes used by the U. S. Navy from WW I to modern times. Collector-historians of military electronics will find it useful in tracing the origins of items of equipment and the histories of some of the makers.

With today's interest in vacuum-tube audio systems, Carlos Fazano's "A Brief History of the Valve Audio Amplifier" examines the development of high-fidelity amplifiers from the earliest tubes to the classic units of the late Fifties.

In "The Eaton Tube Collection Revisited," major collector Jerry Vanicek reexamines the Eaton tube display described in Review Vol. 6. He contributes additional details on the "landmark" tubes that comprised this lost collection, and on the general development of tube designs in the Teens.

In Review 2, historian Art Goodnow provided a comprehensive study of the technology of spark transmitters. By contrast, in 1912-1918 the arc transmitter was a "hot" new technology, displacing spark transmitters in new high-power stations. In this year's issue, William Byron's "The Arc Method of Producing Continuous Waves" provides a comparable study of the physics behind this system, its actual applications, and illustrations of transmitters ranging from modest to 70-tonners.

"Bud" Hall gave a well received talk at the AWA Conference of 1987 on the Goddard oscillator, an early invention of rocket pioneer Robert Goddard. This was a patented, *all-electronic* signal generator predating the De Forest (Armstrong) regeneration patent. Unlike the contemporary von Lieben LRS Relay, it was a a vacuum device - no gas ions - without the frequency limitations of mercury-vapor devices. Hall's article details the effect of the Goddard patent on litigation, RCA vs. Collins and RCA vs. Heintz & Kaufman. Because of the H & K connection, details are included on the little-known H & K "gridless" Gammatron.

In searching a museum file, John Anderson, an expert on the history of the General Electric Company, discovered an uncompleted manuscript on broadcast-station progress in terms of transmitter development at GE, "The Evolution of Broadcasting from the Transmitter Viewpoint." The author, ca. 1932, is unknown, but the work is comprehensive; better yet, it is illustrated with great Twenties photos from the GE/Hall of History collection.

Rounding out his indexes of the U. S. patents of radio inventors in previous Reviews, David Kraeuter provides the "Index and Additions to Patents Lists," with additional resource material for the convenience of users.

The book contains 192 pages, same as last year's, and 132 illustrations. Price is $12.50 postpaid (U. S. and Canada; $14 postpaid elsewhere.) It may be ordered with the form enclosed with this *OTB*, or by sending a check payable to "Antique Wireless Association" to AWA, 44 E. Main St., Flemington, NJ 08822-1224. Most of the earlier volumes remain available, too, at the same price - see the accompanying list of contents.

OTHER AVAILABLE AWA REVIEWS

Vol. 1

- The Founding of the AWA and Its Museum (Charles Brelsford)
- John Stone Stone on Nikola Tesla's Priority in Radio and CW Radiofrequency Apparatus (edited by Leland Anderson)
- Farnsworth's Contributions to Modern Electronic Television (Stephen Hofer)
- A Radio Amateur in World War I (Clarence Tuska)
- A Brief History of the National Company, Inc. (John Nagle)
- Atwater Kent Early Radio Development (Ralph Williams)
- Field Test of the Armstrong Wide-Band FM System from the Empire State Building, 1934-35 (Thomas Buzalski)
- An Interview with Paul Godley (Wayne Nelson)

Vol. 2

- De Forest Radio Telephone Companies, 1907-1920 (Thorn Mayes)
- Across the Gap: An Appraisal of Spark Radiotelegraph Engineering (Arthur Goodnow)
- Atwater Kent Early Radio Development - The Mahogany and Metal Boxes (Ralph Williams)
- Hammarlund Radio (Stuart Meyer)
- A Century of Telegraph Key Development (Louise Moreau)
- The Philadelphia Radio Story - The First Fifty Years (Rex Matlack)

Vol. 3

- Atwater Kent Radio Development, Part III - The AC-Powered Receivers (Ralph Williams)
- Program Transmission and the Early Radio Networks (Ludwell Sibley)
- Audio-Frequency Characteristics in Early Broadcasting (Robert Morris)
- AC Supply for Radio Receivers - How the Lowell and Dunmore Patents (Almost) Changed the Industry (Alan Douglas)
- The Radio Apparatus of Ernest C. Mignon (Lauren Peckham)
- Foreign and Military Telegraph Keys (Louise Moreau and Murray Willer)
- The Alexanderson System for Electromechanical Production of Radio-Frequency Energy (Glen Fuller).

Vol. 6

- The Eaton Tube Collection (George Clark, Bruce Kelley, Lauren Peckham, Lawrence Horle, William Eaton)
- The General Electric Company Considers Buying the De Forest Radio Telephone and Telegraph Co., 1916 (John Anderson)
- The First Years of Wireless in the Hawaiian Islands (Robert and Tina Wiepert)
- A Review of Early Television in the UK (Pat Leggatt)
- Signal Corps SCR-BC-RC Directory (Frederick Chesson)
- Who Invented the Superheterodyne? (Robert Champeix, translated by Richard Foster)
- Amateur Radio in the New York City Area Pre-WW I (Daniel McCoy)
- Radio Tube Manufacture in Australia (Fin Stewart)
- The Military Communications Explosion, 1914-18 (Louise Moreau)
- The U. S. Patents of Alexanderson, Carson, Colpitts, Davis, Gernsback, Hogan, Loomis, Pupin, Rider, Stone, and Stubblefield (David Kraeuter)

OTB BACK ISSUES

The following issues of the *Old Timer's Bulletin* are in stock and orderable via AWA, 44 E. Main St., Flemington, NJ 08822-1224.

Volume and Number

14-4	18-2	18-3	19-4
21-2	21-3	25-2	25-3
27-1	27-2	33-1	33-2
33-3	33-4		

Also, in Vols. 20, 22-24, 26 and 28-32, *all* four numbers of *each* volume are available. Prices are $2.50 each postpaid.

Also in stock are the following monographs at $1.50 each: "Priority in the Invention of Radio: Tesla vs. Marconi" (Leland Anderson; 9 pp.); "The Federal Telegraph Co., 1909-1920" (Thorn Mayes; 13 pp.); and "The RJ-4 Detector and the Wallace Mystery" (Gerald Tyne, 13 pp.). Index to *OTB* Vols. 16-32 and Review Vols. 1-6, free on request with purchase. [LAS]

SPECIAL-TOPIC ISSUES

Several *OTB* issues in the past three years have had special themes. Each contains the normal columns, etc., but also a core of features centered on a particular topic area. These remain available as shown above. The number of special-focus pages in each issue is listed below.

- **Broadcast Receivers** (30-4, Feb. 1990) - 12 pp.
- **Communication Gear** (32-1, May 1991) - 18 pp.;
- **International** topics and equipment (31-4, Feb. 1991) - 11 pp.
- **Military equipment** in both wars (30-3, Nov. 1989) - 17 pp.
- **Restoration** (31-2, Aug. 1990) - 20 pp.
- **Tubes** (incl. light bulbs) (31-3, Oct. 1990) - 19 pp.
- **Wireless** equipment and stations (31-1, May 1990) - 15 pp.

THE E. H. SCOTT SPECIAL COMMUNICATIONS RECEIVER

Bruce Kelley, W2ICE
59 Main St., Bloomfield, NY 14469

John T. Meredith
Marina Cove Drive, Niceville, FL 32587

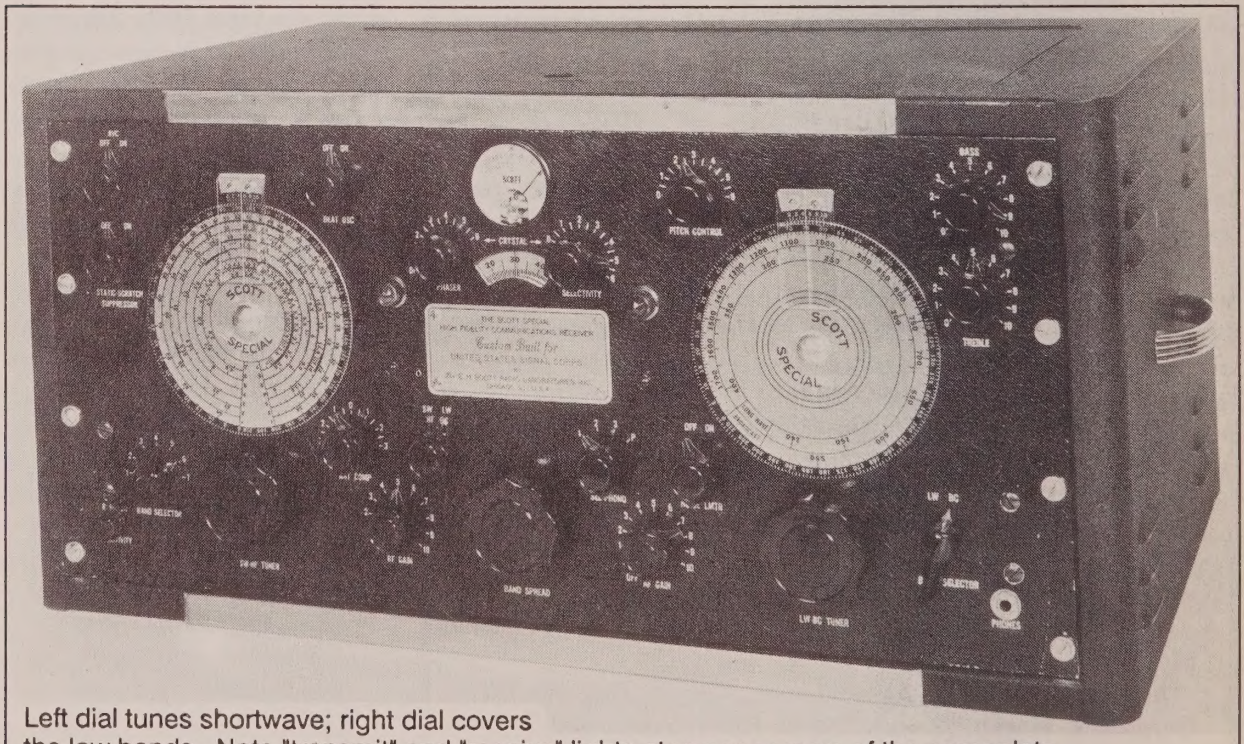
It was 1939 and the world was drawing close to war. Overseas stations were beaming news and propaganda 24 hours a day and E. H. Scott, ever the DXer, wanted to keep abreast of events. In case of war, too, the electronics market would turn from consumer to professional equipment. The result: the Scott Special 26-tube communications receiver.

Unlike other receivers of the day, it contains two complete, separate front ends. One tuner, with two bands, covers long-wave and broadcast - 140 kHz to 1710 kHz. The other tunes the shortwave spectrum in seven bands, 1.7 to 64 MHz, for a total of nine tuning ranges. This is a ratio of 460:1, or eight-plus octaves.

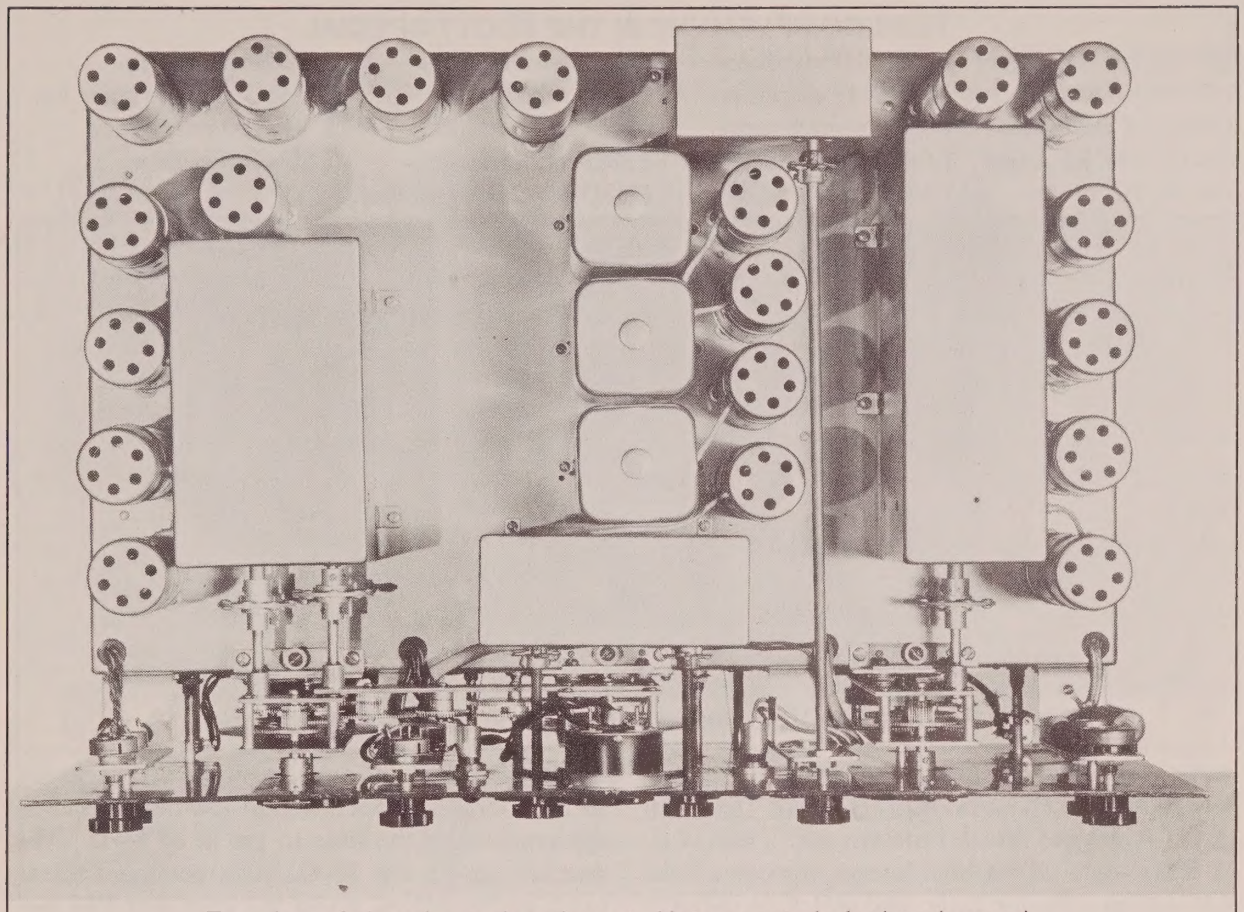
Both tuning knobs have flywheels for smooth operation. As with Scott's home receivers, the broadcast-band dial scale is calibrated every 10 kHz. There is calibrated electrical bandspread on the shortwave bands, with a third dial - *vernier bandspread* - visible in the center of the front panel. Individual graphs of the frequency vs. vernier scale were provided for the 5-, 10-, 13-, 16-, 19-, 20-, 25-, 31-, 49-, 80-, and 100-meter bands.

The set provides a BFO for CW reception, crystal filter with phasing control, amplified AVC, variable selectivity, a signal-level meter calibrated in "S"-units and decibels, a send-receive relay (with red and green lights!), and other features found in better communications receivers. A special feature is electrostatic shielding between the primary and secondary windings of each antenna transformer, minimizing transfer of unbalanced noise voltages arriving on the balanced antenna line. Promoted as "Super Shield," this feature had been developed by Murray Clay, one of Scott's chief engineers. There are separate unbalanced antenna inputs for the 20.1-37.0 and 33.3-64 MHz bands. The set has two tuned RF stages on all nine bands and a total of 19 panel knobs plus accessory indicators. The chromed chassis is housed in a 19" rack cabinet, with external amplifier-power chassis.

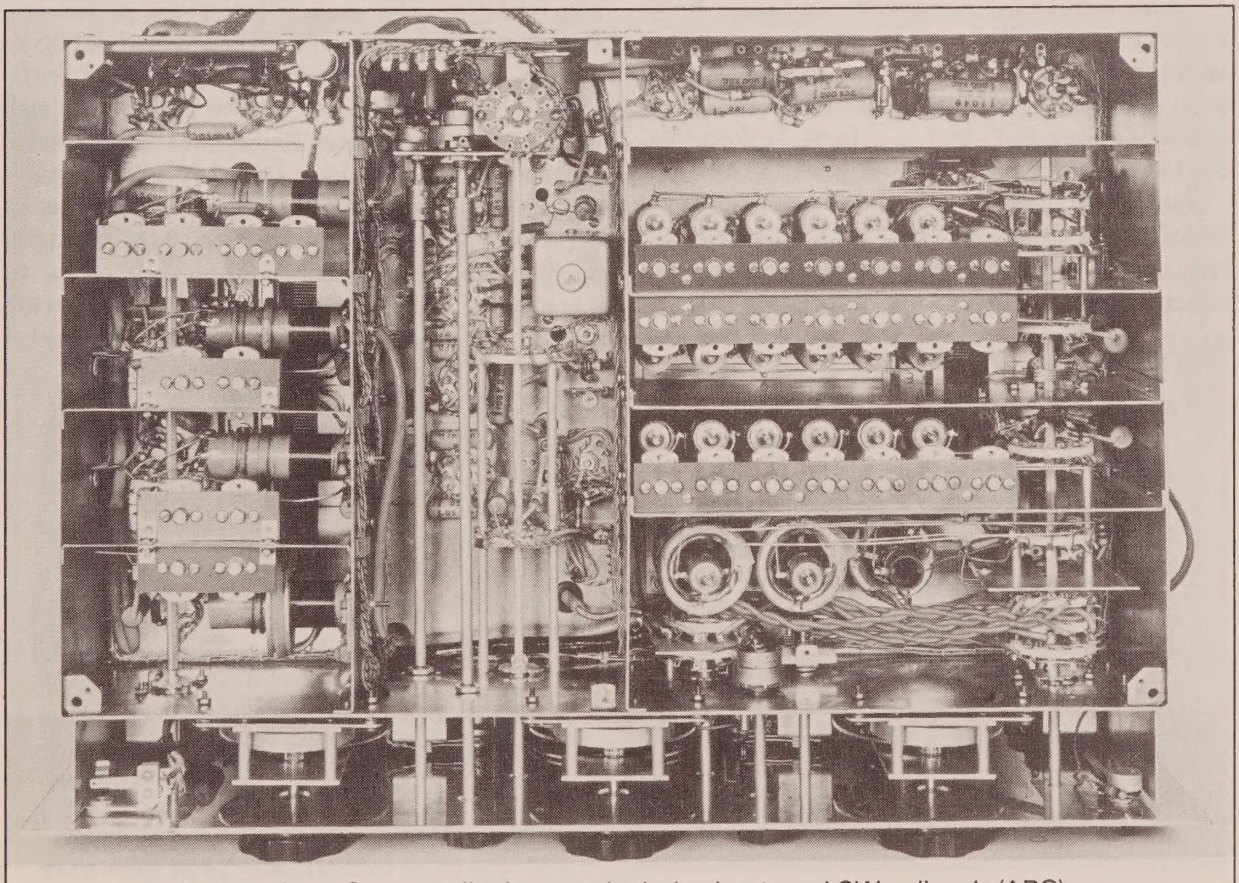
Although not a prerequisite for a communications receiver, the famous Scott high-fidelity audio system is employed, consisting of a pair of 6J5s driving push-pull 6L6Gs (ca. 35 watts output) with feedback. Treble and bass controls are included. To enhance listening pleasure, the receiver has a phono input with a scratch suppressor (usable, in radio operation, in addition to a conventional noise limiter). The receiver manual does not specify audio frequency response but does show selectivity curves (3 to 16 kHz wide at 6 dB down, or 250 Hz wide with the crystal filter). As with the home sets, a high-frequency equalizer "brings back" the treble response despite the IF selectivity. Circuit-wise, the power chassis shows origins in the Phantom and Sixteen home receivers, and is very close to that of the Phantom Deluxe FM. The set could be used with headphones, or with a Scott 12-



Left dial tunes shortwave; right dial covers the low bands. Note "transmit" and "receive" lights at upper corners of the nameplate.



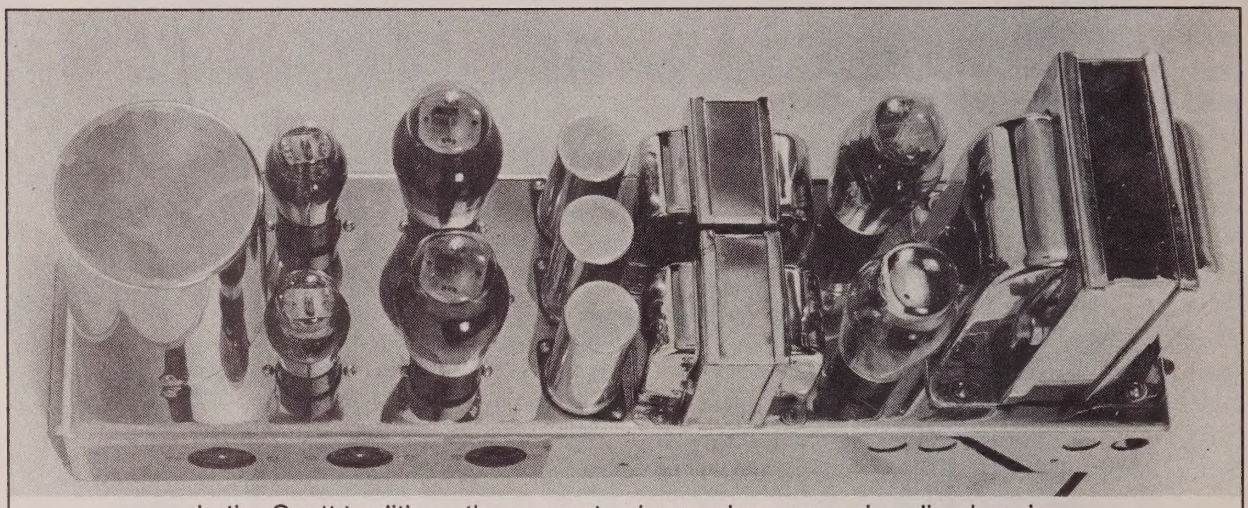
Top view of chassis - a clean layout. Note gear train for bandspread.



Bottom view. Scott quality features include slug-tuned SW coils, air (APC) trimmer capacitors on heavy phenolic insulators, and tight shielding.

TUBE COMPLEMENT IN THE SCOTT SPECIAL

2 6U7G LF RF amps	1 6J5G HF oscillator	1 6J5G phase inverter	1 6J5G meter amp.
1 6L7G LF mixer	3 6K7G IF amplifiers	2 6J5G audio drivers	1 6H6G Dickert noise lim.
1 6J5G LF oscillator	1 6J7G scratch supp.	2 6L6G audio output	1 VR-150 voltage reg.
2 6U7G HF RF amps	1 6B8G detector-BFO	1 6B8G scratch supp.	2 5U4G rectifiers
1 6L7G HF mixer	1 6K7G first audio	1 6U8G AVC IF amp.-rect.	



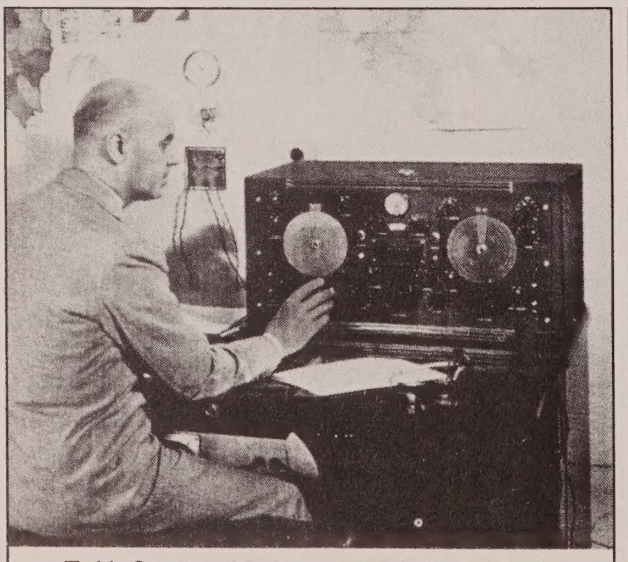
In the Scott tradition: the separate chromed power-and-audio chassis.

inch speaker and crossover network.

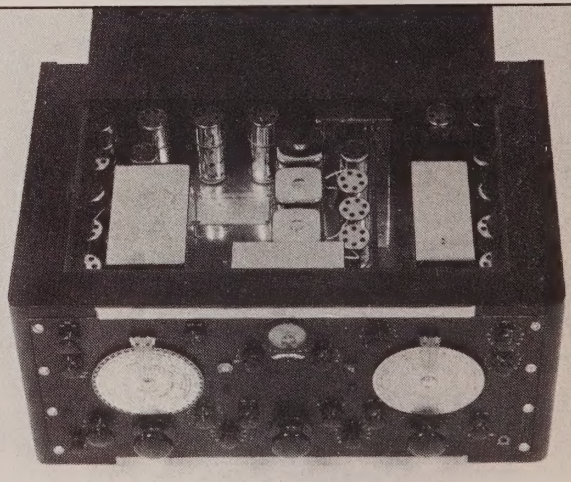
Marvin Hobbs' fine book, E. H. Scott, The Dean of DX (Chicago: North Frontier, 1985), tells of E. H. listening to rebroadcast foreign news on a local AM station with one tuner, and switching instantly to the foreign broadcast pretuned on shortwave with the other tuner for comparison.

There is little difference between Scott's home version and the military model. A large nameplate in the center of each set bears the engraving: "The Scott Special/ High Fidelity Communications Receiver/ Custom Built for/ --- / by E. H. Scott Radio Laboratories, Inc./ Chicago, Ill. U. S. A."

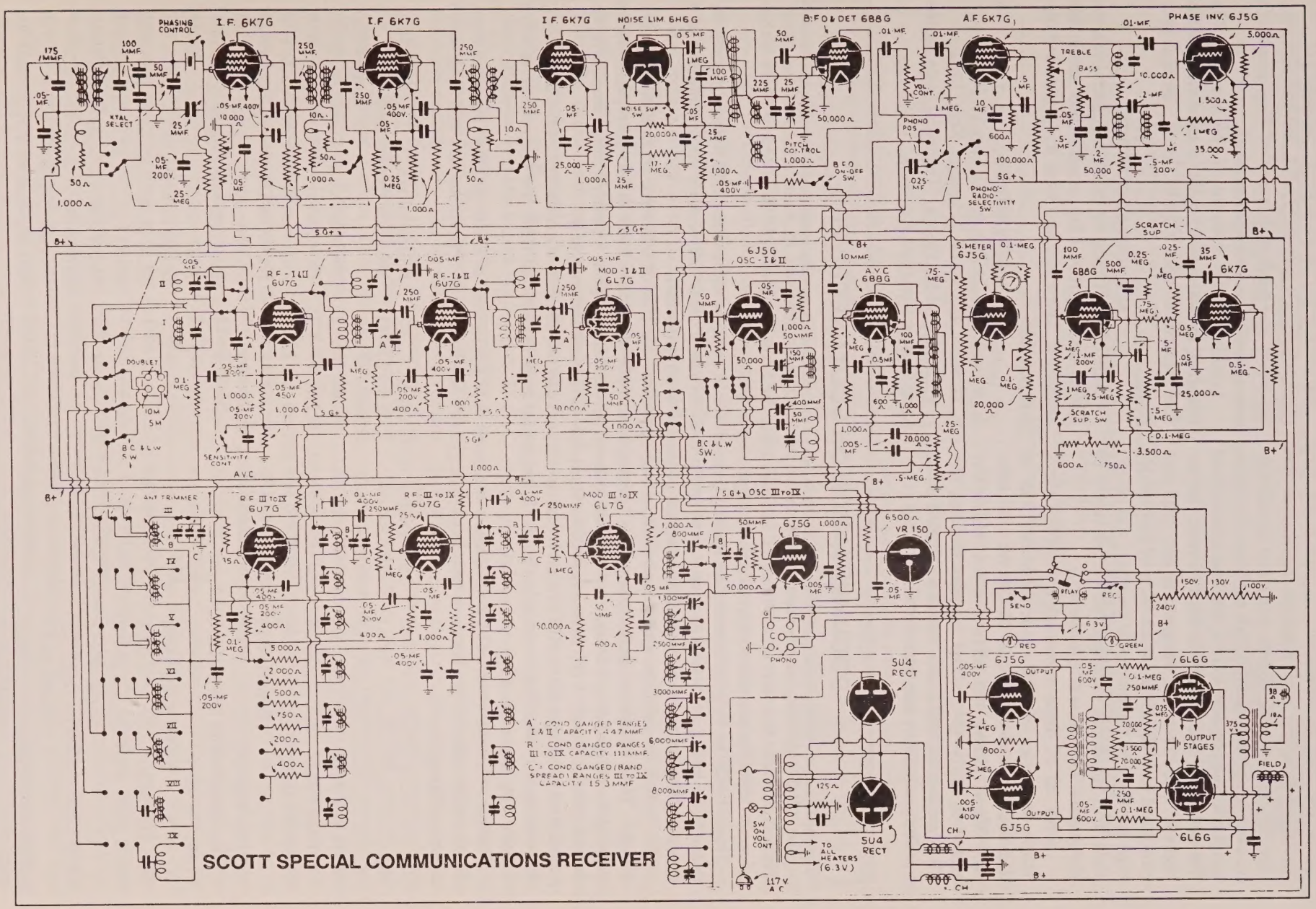
Technically the set is a bit quirky. The extraordinarily wide frequency range, in a single-conversion superhet, overstresses the balance between selectivity and image-ratio performance. The RF stages use the 6U7G tube, basically a repackaged 78 from 1933 and not the best low-noise technology available at the time to use at 64 MHz. The receiver covers the 30-42 MHz communications band, and appeared about the time that FM mobile systems became important; it also tunes the 42-48 MHz FM broadcast band. Yet it lacks an FM detector. The explanation is that it was designed in July-August 1939, with production beginning in September and extending into the early spring of 1940. (The first set was Scott's personal one.) At the time, Scott Radio Labs did not have a chief engineer. Murray Clay had left the company in April, and Marvin Hobbs came to Scott in September. Mr. Hobbs recalls seeing the first unit being assembled on his first visit to the factory. It was Clifford Coon, Chief of Production, along with



E. H. Scott at his home in Highland Park, Illinois, DXing with the Scott Special.



A Special today. This one varies in details from the other sets shown. It has RCA-style knobs; the bandspread dial differs slightly; and the nameplate is on the chassis, not the panel.


SCOTT SPECIAL COMMUNICATIONS RECEIVER
PHASING CONTROL
I.F. 6K7G
I.F. 6K7G
I.F. 6K7G
NOISE LIM. 6H6G
B.F.O. & DET. 6B8G
A.F. 6K7G
PHASE INV. 6J5G
RF-I & II 6U7G
MOD-I & II 6L7G
6J5G OSC-I & II
A.V.C. 6B8G
S. METER 6J5G
SCRATCH SUP.
6K7G
RF-III to IX 6U7G
MOD III to IX 6L7G
6J5G OSC III to IX
VR 150
5U4 RECT
6J5G
6L6G
OUTPUT STAGES
FIELD
ANT TRIMMER
DOUBLET
BC & LW SW
SENSITIVITY CONT
A.V.C.
PHONO
PHONO-RADIO-SELECTIVITY SW
BFO ON-OFF SW.
PITCH CONTROL
NOISE SUP. SW
VOL. CONT.
TREBLE
BASS
SCRATCH SUP. SW
SEND
RELAY
REC.
RED
GREEN
A: 2 GANG RANGES I & II CAPACITY 447 MMF
B: 2 GANG RANGES III TO IX CAPACITY 111 MMF
C: 2 GANG (BAND SPREAD) RANGES III TO IX CAPACITY 15.3 MMF
SW. ON VOL. CONT.
117 V A.C.
TO ALL HEATERS (6.3 V)
CH.
B+
S.G.+
OSC. III to IX

Scott, who designed the receiver (Coon's signature is on the factory schematic diagram.) It was Scott's idea to put two receivers together as the Special. By contrast, Hobbs was hired specifically to put FM in Scott radios. This explains why Coon employed the obsolete 6U7G, whereas Hobbs used the new, "hot" 1853/6AB7 in the FM tuner he designed. The tuner was designed in late 1939 and produced in 1940. (For a discussion of Hobbs' design for the FM Philharmonic receiver, see his article "FM Receivers - Design and Performance" in the August 1940 issue of *Electronics*.)

Only 20 of these remarkable receivers were made, at a price of $650. One could buy four of Hallicrafters' top-of-the-line SX-28s for that sum. The Signal Corps was offered a set, which was tested in early 1941. For obvious reasons, the Government wanted a less expensive, scaled-down version for military use, like the Navy's RBO.

Of the seven receivers known to exist today, the serial numbers are assigned between JJ 251 (Scott's personal set) and JJ 271. Several sets were exported; one was used at one of New Zealand's consulates for communication work.

Looking at this treasure of the past, one can visualize, in the same cabinet, a modern amateur SSB transceiver with a 1-kW linear. Such is progress.

ACKNOWLEDGEMENTS

Both of E. H. Scott's chief engineers, Marvin Hobbs and Murray Clay, contributed invaluable assistance. Jim Clark and Kent King provided further support.

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E. H. Scott, in *Radio & Television*, Sept. 1940.
E. H. Scott and M. Hobbs, "Technical Data on the Scott Communications Receiver," 1939.

DOCUMENTATION ON SCOTT RECEIVERS

The following listing covers repair information on Scott radio receivers in Rider's binders and Sams' Photofacts, from the start up to "the end" in 1955, after the Scott line had been acquired by Meck Industries. It omits the television receivers made beginning in 1948.

This list may be helpful because the Rider's indexes are in error in some cases, and because Scott's inconsistent naming of models is a source of confusion. In many cases the Rider's documentation of a model is exhaustive, being essentially a reprint of the full service manual.

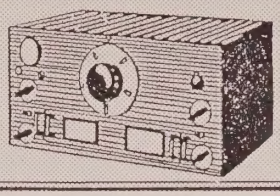
The Rider's information was published in an odd sequence: early Scott sets were documented in Vols. 1 and 3. Then silence set in for some years - perhaps Scott preferred to protect its service-representative network by withholding information from the general service trade. Then a policy change may have occurred: Vols. 14 and 15 retroactively document models of the intervening years.

Collectors having a Navy RBO receiver but no manual can use the Rider's coverage of the SLR-12-A; it is *very* close to the Navy instruction book. Likewise for owners of the SLRM: the "Export" material in Rider's Vol. 18 serves nicely.

Postwar sets were covered by both Rider's and Sams until the demise of Rider in 1954. As given here, the numbers refer to the Rider volume and page (in the Scott section). Photofact sets and folders are shown as "Sams."

16 14-65
16A 18-81
18 14-65
145 Power Pack 1-4
150 Power Pack 1-5
310 (AM-FM RP) ..... 21-1; Sams 154-11
500 (AM-FM RP) 19-1
510 Kenilworth and Sheffield (AM-FM RPs) 21-11; Sams 165-4
515 (AM-FM RP) 22-1
800-B (S/N < 2000) ..... 15-31; Sams 165-11
800-B (S/N > 2000) ..... 15-35; Sams 14-27
800-B6 whistle filter 16-2
1000 ..... Sams 180-8
1510 ..... Sams 181-11
1933 Deluxe 3-2
1933 Deluxe AVC Super 3-2
2000 ..... Sams 229-13
2510 ..... Sams 233-10
9052 ..... Sams 265-12
All-Wave Super 1-3
All-Wave 2-V Battery 15-20
All-Wave 15 15-23
Dynamic Noise Suppressor Sams 46-21
Export 18-1
FM 14-8
FM Converter 15-1
FM Tuner 14-1
Imperial 1933 Super 3-2
Imperial All-Wave 16-1
Imperial All-Wave (revised volume expander) 16-1
Laureate 14-29
Laureate rev. (1941) 15-5
Masterpiece 14-35
Metropolitan 18-81
Musicale (phono amp.) Sams 44-20
Phantom 14-37
Phantom rev. (1939) 15-9
Phantom Deluxe 14-2
Phantom Deluxe rev. 15-13
Philharmonic 14-43
Philharmonic Combo. 14-5
RBO 18-42
Shield Grid 9 1-1
SLR-12-A 18-42
SLRM 18-1
Super XII 14-63
Symphony AC 3-1
World's Record 10 1-1
World's Record Screen Grid 10 3-1

THE COMMUNICATION RECEIVER



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All correspondence requires SASE for reply

THE E. H. SCOTT LOW-RADIATION MARINE RECEIVERS OF WORLD WAR II

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The Scott low-radiation receivers of World War II had a significant impact on the war effort. These radios were not just "morale receivers" for sailors and soldiers, but marked a technological advancement which made sure of thwarting the direction-finding equipment of the German Navy. These sets contributed greatly to the supply effort for England and to war activity in both the Pacific and the Atlantic theaters of operation.

INTRODUCTION

By April 1941 the Battle for the Atlantic had escalated to a new level, with the German U-boats sinking 249,000 tons of shipping, a rapid acceleration from January when 126,000 tons were lost [1]. In effect, the U-boats were sinking more ships than Britain and the United States together were building, and the ability to keep England resupplied by ocean convoys was becoming critical. During this bleak month, Earnest H. Scott, president of the E. H. Scott Radio Laboratories of Chicago, made an eventful trip to Washington, D. C.

Mr. Scott's primary concern was to explore with the Army and Navy Departments how his company could contribute to the impending involvement of the United States in the war. Accompanied by his chief engineer, Marvin Hobbs, they met with General Roger Colton, Director of the Signal Corps Engineering Laboratories, and Cmdr. Jennings B. Dow of the Design Division of the Bureau of Ships of the Navy [2].

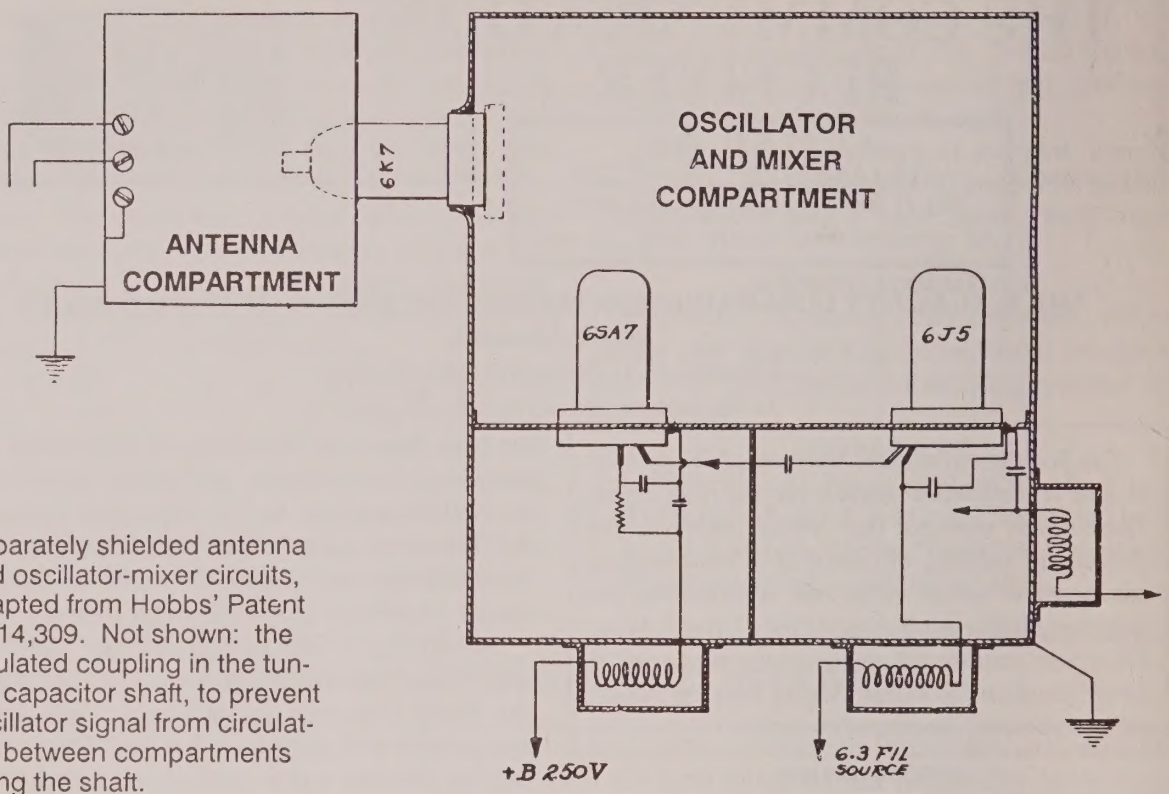
Scott and Hobbs realized that their company was in a weak competitive position. While Scott Radio Laboratories did license the Armstrong FM patents for home entertainment receivers (the Phantom and Philharmonic receivers of the period), they had no experience with the narrow-band FM being adopted by the U. S. Army for field communications. Scott decided that the best opportunity was with the U. S. Navy, and on this basis he directed the development of Scott marine receivers.

On returning to Chicago in late April, Scott instructed Hobbs to construct a prototype multiple-band AM receiver which could be used for entertainment aboard ships. Reasoning that crewmen, far from home for extended periods, would enjoy listening to news, music and sports via shortwave or local broadcasts, he developed the concept of the "morale receiver." The first of these was a variation of the Scott Laureate, with the prototype simply a Laureate in a black metal cabinet.

Returning to Washington in May, 1941, Scott and Hobbs introduced the receiver to the Navy at the Naval Research Laboratories. The concept was greeted with optimism, but the Navy specified that the receiver had to meet strict radiation limits to evade detection by submarines [2, 3].

By way of explanation, early in WW II the German navy had been highly successful in pin-pointing convoy locations. Their radio intelligence service, B-Dienst, using sensitive direction finders, could reportedly detect radiations from regenerative receivers on board the ships, detecting signals up to 100 miles away [1, 4, 5]. Once this became suspected by the Allies, the merchantmen in convoys for a time came under strict radio silence, for both transmitters and receivers, through much of their voyages. Under these conditions, the only means of communication between ships was by line of sight using flags or optical signaling devices.

The main source of the radiation was probably obsolete receivers like the IP-500 aboard merchantmen - remembering that the ship owners had suffered through the Depression years with limited capital for radio modernization. Simple regenerative designs without RF amplifiers are famous for radiating, even to the point of being usable as transmitters. However, all sets on board, both authorized and non-authorized, were suspect. Some superheterodyne communication receivers of the day were prone to oscillator emission. Scott's 1942 *Radio-Craft* article "How Ship Receivers Give Away Their Positions" [5] cited an FCC notice prohibiting operation of all types of broadcast receiver on board ocean-going ships because of the danger of radiation. He also pointed out that "modern" receivers, even with RF stages and more shielding, could still radiate, and that claimed sensitive direction-finding equipment could detect the signal.



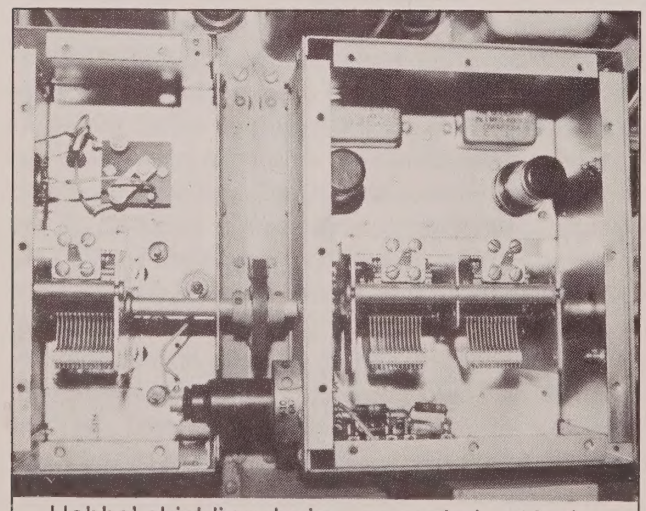
Separately shielded antenna and oscillator-mixer circuits, adapted from Hobbs' Patent 2,314,309. Not shown: the insulated coupling in the tuning capacitor shaft, to prevent oscillator signal from circulating between compartments along the shaft.

Although the concept of the "morale receiver" for the Navy and Merchant Marine was excellent, Scott had to meet the Navy's limits. Hobbs concentrated his efforts toward this end.

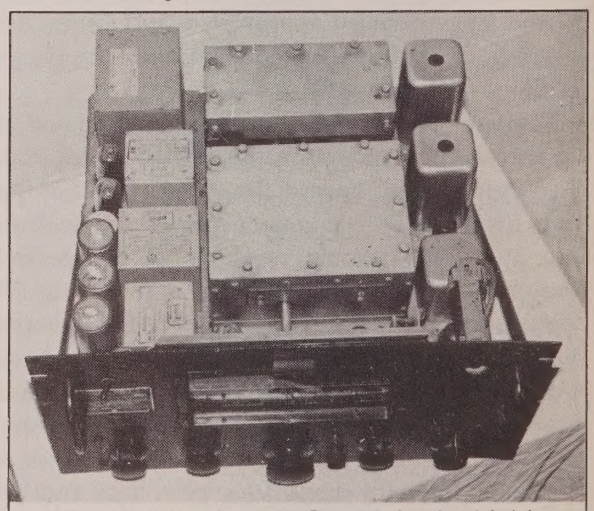
RECEIVER RADIATION

The problem of a superheterodyne receiver emitting detectable radiation was apparent long before WW II. The local oscillator of the superhet circuit generates a signal to beat with the incoming RF signal in the mixer stage, with the heterodyne then processed through the IF, detector, and audio stages. Unfortunately some of the energy generated by the oscillator feeds back into the RF stage and is then radiated by the antenna. Thus, the local oscillator of the receiver can function as a low-powered transmitter, radiating a signal which can be picked up by sensitive receiving equipment.

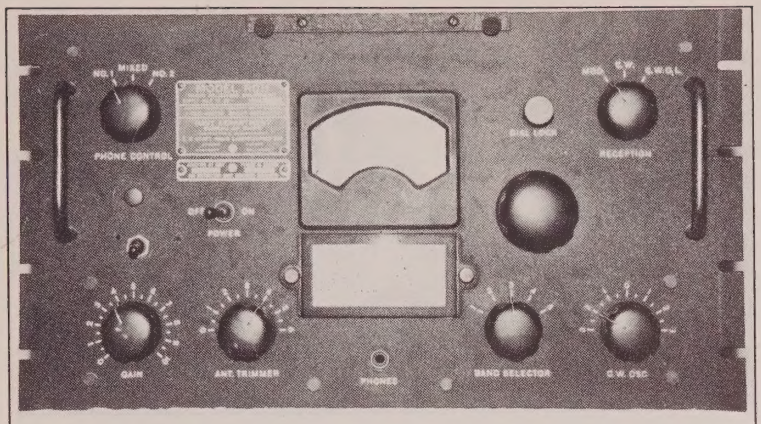
This emission problem was known to radio manufacturers of the mid-1920s, and several companies attempted to deal with it without much success. The first serious attempt to resolve it was by Jackson Pressley, an Army sergeant who had worked for then-Captain Armstrong in France and was later promoted to captain himself. He developed a bridge circuit between the input of the first detector and the antenna which cancelled most of the signal from the oscillator to the antenna. He attempted to market a superhet receiver with this feature, but was unsuccessful due to the extra cost of the added circuit. In spite of this attempt, receivers continued to radiate, and the situation persisted through the 1930s.



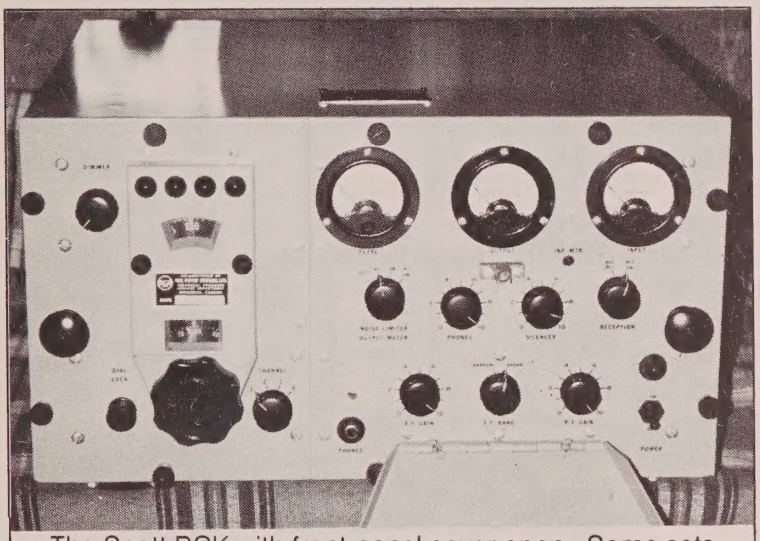
Hobbs' shielding design, as carried out in the RBO. *Photos: Kent King*



Front view of an RBO, with both shield covers in place.



The Scott RCH. *Photo: Kent King.*



The Scott RCK with front-panel cover open. Some sets were painted black. *Photo: John Meredith.*

Hobbs approached the problem of receiver radiation by the following design improvements, for which he received U. S. Patent 2,314,309 [6].

- The antenna circuit and the mixer and oscillator circuits were placed in separate shielded compartments, and the first RF tube was positioned to bridge these two compartments. The antenna circuit was electrically isolated by an insulated coupling between the tuning condensers.
- The voltage supplies to the mixer and oscillator stages were electrically isolated by RF filters.
- These filters were in turn isolated by placement in their own individually shielded compartments.

Besides these patented features, the antenna coils had an electrostatic (Faraday) shield to prevent capacitive coupling of leakage. Devised for peacetime Scott receivers as a noise-reduction measure, this feature had a new application in war.

By adding these refinements to the circuit, the oscillator emissions were reduced to such a low level as to give no detectable radiation at 25 feet from the receiver, thus precluding detection [2, 5]. These measures gave assurance that the receiver could be used at sea, while the U-boats would be forced to rely on visual sightings to establish convoy locations, making them more vulnerable to attack [1, 2, 3].

Scott's *Radio-Craft* article claimed outright that the subs could locate *superhet* receivers up to 100 miles. In doing so, he treated equally the radiation from regenerative sets with that from supers. It is not hard to calculate a 100-mile detection range from an IP-500 receiver (or British equivalent). This would pertain to a set adjusted to oscillate for CW reception, standing watch on 500 kHz in a low-noise environment like the North Atlantic. The leakage from a superhet, even a poorly designed one, is vastly lower. Scott, the skilled product promoter with a need to sell receivers, was writing in 1942 when the details of German submarine operations could hardly have been known. By contrast, Hobbs, the engineer, claims only that the low-radiation sets were built to meet the tight radiation limits that had been established. He was writing the history of Scott 40 years later [2, pp. 128-129], after the facts were in.

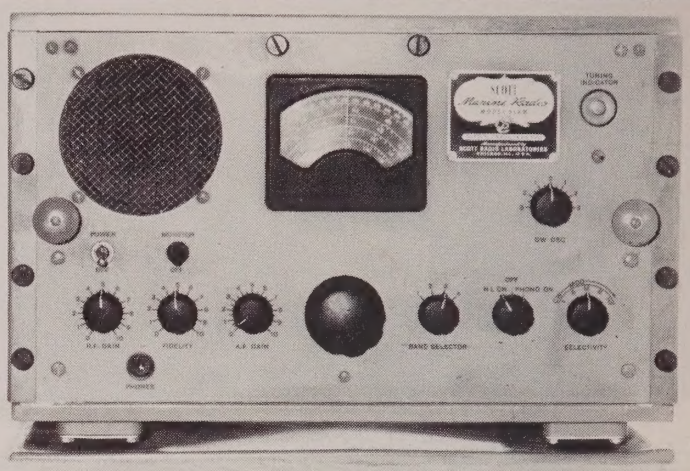
There is a reason for requiring non-radiating receivers besides security: electromagnetic compatibility on the ship. A warship of carrier size had dozens of superhet HF receives. It wouldn't do to have the off-duty crew listening to, say, Tokyo Rose on 11,897 kHz, with their receiver interfering with a radioman on the same vessel trying to copy the Fleet Broadcast on (11,897 + 455) or 12,352 kHz. The Scott sets would have served well in this regard.

Somewhat confusing is the fact that E. H. Scott produced several receivers of very similar circuitry but with different designations. The reason is that separate government branches were setting specifications, the Department of the Navy and the Maritime Commission. The Navy set forth the requirements for the RBO, RCH, RCK, and REE; whereas the Maritime Commission specified requirements for the SLR-A, -B, -F, -H, and -M, accepting the SLR ("Scott Low Radiation") designation. The Federal Communications Commission provided compliance testing for the Maritime Commission.

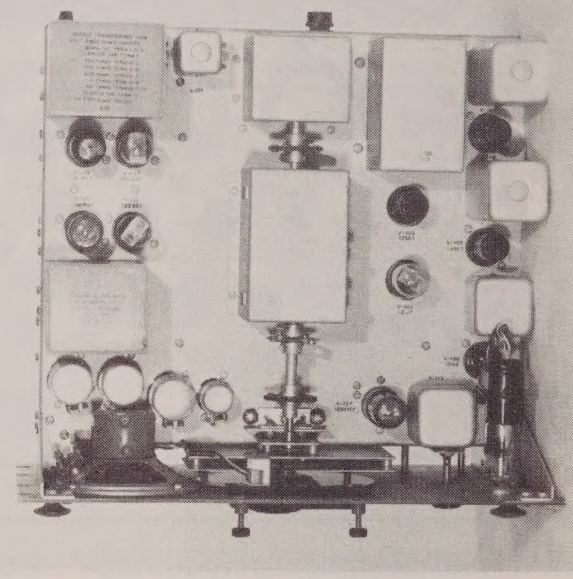
RECEIVER LINEAGE

The first of the Scott low-radiation receiver line was the 12-tube SLR-12-A mentioned above, presented to the Navy Department in May, 1941. Adopted as the RBO (CZC-46225), it was a

ruggedly built set with all-hermetic transformers for the marine environment, with the patented RF stage, separate oscillator, two IFs, and single-ended audio output stage. A noise limiter, no luxury for reception in the tropics, was included. Range was 0.53-1.6 and 5.55-15.6 MHz, AM-only, with a phonograph input [8]. It was housed in a steel cabinet to take a 19" rack panel with the receiver, to be bolted to a table top or bench. The chassis was designed for easy removal from the front. The recommended antenna was up to 50 feet including lead-in. On small DC-only ships, 60-Hz power came from a Scott Model 262 250-watt vibrator inverter.



The SLRM. *Photos: John Meredith*



Top view. The RF stage is in the shield box at upper right.

From the SLR-12-A/RBO was developed the SLR series, the REE, the RCK, and the RCH. For the most part these sets were used for information and entertainment, fulfilling the concept of the "morale receiver." The RCH and most of the SLR variants (aside from the SLR-A in early 1942) were developed in early 1943, the REE and the SLRM in 1944.

OPERATIONAL USE

The operational use of the various Scott low-radiation receivers was dependent on both the specifications of the individual receiver and its deployment role. All the receivers, whether built to Navy or Maritime Commission specifications, had to meet the Navy requirements for low radiation.

In the Navy a typical installation, on all but the smaller ships, consisted of a group of receivers, usually a set of four, as was common with the RBO. The four outputs were fed to amplified loud speakers (e. g., RCA CRV-49131A) throughout the ship, with a switching arrangement allowing for the selection of one of the audio channels depending on listener preference. The RCH, with its own external speaker, suited single-receiver operation, while the RCK employed primarily headphones for the audio output.

RCH and AN/SRR-3

The RCH (CZC-46209) was a multipurpose 11-tube communications receiver for use on the merchant marine and smaller Navy ships. The frequency range was 50-500 kHz and 1.8-27 MHz in five bands. (The 1942 Radio Craft article cites a predecessor with 80-580 kHz and 3-24 MHz coverage.) A BFO was included, and in addition, an audio mixer circuit which allowed for the monitoring of a second audio input from a second receiver. A switch on the panel could select either audio channel individually or a mix of the two, an unusual feature.

A variant of the RCH was the AN/SRR-3 [9], with range of 80-560 kHz and 1.9-24 MHz. It comprised an SLR-F receiver, Scott Model 202 inverter, and Scott SPM-8 8" speaker. The panel layout was the same, but with nameplate moved below the dial.

RCK

The Scott RCK differed from the others in that it was a response to a Navy need for a ship receiver for VHF aircraft communications. An 18-tube crystal-controlled superhet with high resistance to cross modulation, it was used primarily on aircraft carriers and Navy shore stations for voice communication with aircraft [10]. The frequency range was 115-156 MHz, with a four-channel preselector as a plug-in unit. This design allowed the preselector to be exchanged for another unit which could extend the tuning range higher. Thus this

receiver could serve a dual function as a communication set and as a signal-search receiver for enemy radar [2].

SLRM and REE

The SLRM (Navy designation: REE) was the last of the Scott low-radiation receivers to be developed, to meet a 1944 Maritime Commission specification for smaller merchant ships. Thousands of these were ordered, allowing practically every ship, regardless of size, to have some variation of the Scott LR receivers. It was seen frequently aboard lightships and trawlers as well as cargo vessels. Covering 0.54-1.6 and 1.36-18.6 MHz in four bands, it provided a backup communications capability besides entertainment. It was frequently placed in the wardroom and mess hall. In addition, the captain's cabin commonly had one. An AC-DC version of the SLR-12-A with BFO added, it was a stand-alone unit with internal speaker. (The 120-volt DC feature eliminated the inverter on small ships having only DC.)

The front panel displays an efficient design. RF gain, tone, and audio gain are grouped to the left of the tuning knob. To the right are the bandswitch, phono/limiter switch, and selectivity control. Included are a BFO pitch control, speaker on-off switch, phone jack, and tuning-eye tube. The rear of the set has connectors for phono and external loudspeakers. Mounting arrangements and antenna are the same as for the SLR-12-A/RBO.

The circuitry is a basic superhet with 6K7 RF stage, 12SA7 mixer, 12J5GT oscillator, two 12SK7 IF stages, and 12H6 detector/AVC and limiter. The audio section is a 12SN7 first audio/BFO, 12SN7 second audio/phase inverter, and push-pull 25L6GT output to get adequate audio power (1.5 W) with the low plate voltage available. As with most Scotts, some of the gain from the extra audio stage is invested in negative feedback - both to get better quality and to handle variable loads (one to three speakers). The rectifier is a 25Z6GT; the eye tube, a 1629. Heaters are wired in a 150-mA and a 300-mA string.

Unfortunately for the E. H. Scott Radio Laboratories, the contract for SLRM receivers was canceled toward the end of the war, leaving the company with a large number in stock. These units were offered to the public in late 1945. Perhaps the finest AC-DC radio ever made, the SLRM turned out to be popular for a time with radio amateurs and SW listeners. More importantly, it served as a partial prototype for the first postwar Scott receiver, the Model 800-B [3].

Scott turned the SLRM into the "Export" model in 1947 by small changes [11]: going to a balanced antenna input and single output impedance; eliminating the phone jack, internal speaker, and separate shielding of the RF coils; moving the noise limiter into what had been the BFO tube; and changing the panel design to allow mounting in a cabinet with 12" speaker or custom installation. Like the SLRM, it covered the broadcast band. Shortwave coverage was moved upward to 3.2-23.5 MHz, omitting the 2-MHz marine frequencies. The rugged construction was retained, along with the slug-tuned RF coils and highly stable APC trimmer capacitors. (The name "Export" is a little odd: a receiver optimized for overseas sale would have been a 230-volt design!)

CONCLUSION

The Navy had no alternative to these receivers. Throughout the war, no other manufacturer offered a morale receiver meeting the strict emission requirements set forth by the Navy. If Scott and Hobbs had not taken up the challenge to resolve the emission problem, these special receivers would not have been on board during the Battle of the Atlantic.

Because of the Scott Radio Laboratories' accomplishments in this field, the company received the Navy "E" Award, the Maritime Commission "M" Award, and the Treasury Department "T" Award - one of the few manufacturers to get all three. Marvin Hobbs received a special certificate of commendation from the Navy for his contributions to development of non-radiating receiving and VHF receiving equipment [2].

ACKNOWLEDGEMENTS

I would like to thank Mr. Hobbs for his thoughtful suggestions and technical assistance, and the members of the E. H. Scott Historical Society for their kind support and help in research.

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3. Hobbs, M., personal communications.
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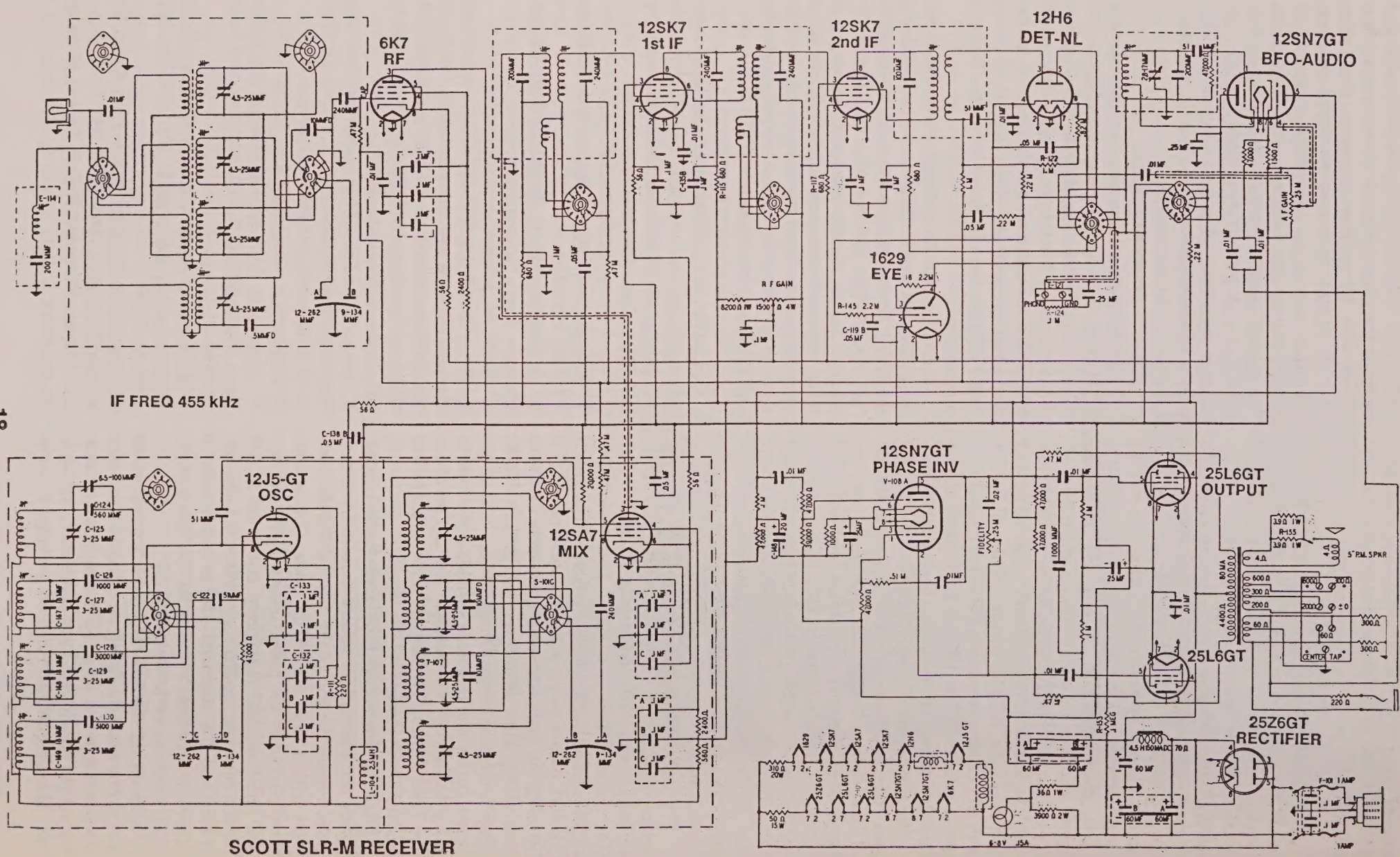
10. Instruction Book for Model RCK Radio Receiving Equipment, NAVSHIPS 900,772, 1945.
11. "Export Receiver," Rider's Vol. 18, Scott pp. 18-1 to 18-41.


6K7
RF
12SK7
1st IF
12SK7
2nd IF
12H6
DET-NL
12SN7GT
BFO-AUDIO
1629
EYE
R F GAIN
IF FREQ 455 kHz
12J5-GT
OSC
12SA7
MIX
12SN7GT
PHASE INV
25L6GT
OUTPUT
25L6GT
25Z6GT
RECTIFIER
SCOTT SLR-M RECEIVER

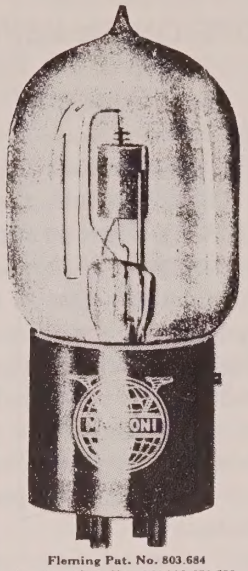
THE PERIPATETIC AUDION

Alan S. Douglas
Box 225, Pocasset, MA 02559

In 1919 Moorhead, de Forest, and Marconi agreed to end their patent-infringement lawsuits. Moorhead, who actually made the tubes, would enter the employ of de Forest, working under the umbrella of his personal license to make and sell, the only rights de Forest had not sold to AT&T. Moorhead would sell all his tubes to Marconi, which would in turn sell to de Forest's company, and to the public. These licensing arrangements are reflected in the tube carton, as each company added its label - somewhat like a steamer trunk on a world tour. Four "Marconi VT" labels have been pasted over the "Moorhead Audion" label that originally sealed the inner carton. These, in turn, have been covered by a bit of paper tape imprinted with the Marconi Company name, perhaps when the tubes were opened and tested by Marconi (according to Tyne, 75% were defective and had to be weeded out). The Moorhead label bears the serial number 0299; the Moorhead VT shown in the photo is not the original tube from this box, but is similar.

If the inner carton resembles an old-fashioned egg crate, it's no coincidence; it was made by the Wallace Egg Carrier Co. of San Francisco.

[For the history of Moorhead and his "ERs" and "VTs," see the two-part article by William Condon, OTB Vol. 28 Nos. 3 and 4, Nov. 1988 and Feb. 1989. Ed.]



Fleming Pat. No. 803.684
De Forest Pat. Nos. 841,387-879,532

A WARNING

To Manufacturers
Importers
Dealers
Jobbers
Agents
Amateurs
Purchasers
Users of

Vacuum Tubes
The Marconi V. T. Patent is Basic

United States Letters Patent to Fleming, No. 803,684, November 7, 1905 has been held to be valid by Judge Mayer of the United States District Court for the Southern District of New York, and by the United States Circuit Court of Appeals for the Second Circuit.

It is a basic patent and controls broadly all vacuum tubes used as detectors, amplifiers or oscillions in radio work.

No one is authorized to make, sell, import or use such tubes for radio purposes, other than the owners of the patent and licensees thereunder. Any others making, selling, importing or using them alone or in combination with other devices, infringe upon the Fleming patent and are liable to a suit for injunction, damages and profits. And they will be prosecuted.

THE AUDIOTRON AND THE LIBERTY VALVE ARE NOT LICENSED UNDER THE FLEMING PATENT.

The price of the genuine Marconi V. T. delivered is $7.00 each. The standardized socket is $1.50 additional. The standard resistance, complete, costs $1.00 and is made in the following sizes: ½ megohm, 1 megohm, 2 megohms, 4 megohms, 6 megohms.

Do not take chances by making, importing, selling, purchasing or using vacuum tubes for radio purposes not licensed under the Fleming patent. By selling, purchasing or using licensed tubes for radio purposes you secure protection under the Fleming patent and avoid the risk of litigation for infringement thereof.

This warning is given so that the trade and public may know the facts and be governed accordingly.

Send all remittances with order to COMMERCIAL DEPARTMENT

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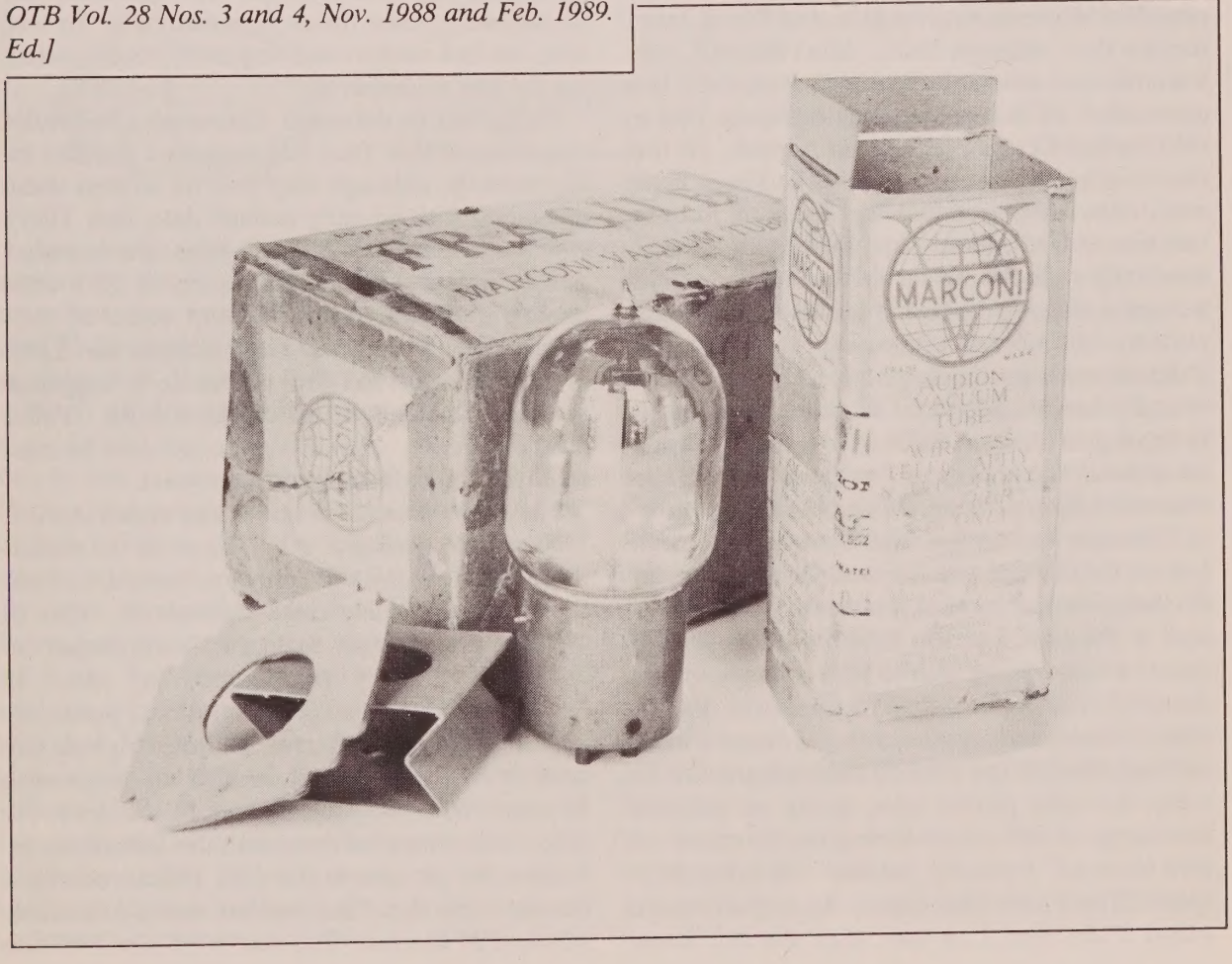
136 Federal St. Boston, Mass.
109 South 2nd St. Philadelphia, Pa.



A FOOTNOTE ON AN IMPORTANT COLOR-TUBE INVENTION

Edward W. Herold
332 Riverside Dr. E., Princeton, NJ 08540-5414

Many years after RCA demonstrated the first color TV picture tube, RCA's inventor, the late Dr. Harold B. Law (1911-1984), wrote an autobiographical account of how he made the key inventions that led to the color tube [1]. One of these inventions was a photographic method of directly depositing the color phosphors on the faceplate of the picture tube, a method that has been used universally since about 1954. In a footnote, Law mentions that he prevailed in a patent interference with another (unnamed) inventor. The present story amplifies that footnote.

Law proposed deposition of phosphors by photolithography (dichromate-sensitized gelatin) in 1948, but RCA did not file for a patent in his name until July 19, 1951. By that time, other companies were working on color tubes, notably Philco. On September 26, 1951, Philco filed a similar patent application in the name of one of their employees, John W. Tiley. The U. S. Patent Office declared an "interference" and took testimony to determine who should be granted the patent. The general rule is that the first person to "reduce to practice," i. e., either to file or to use the idea successfully, is the winner. It took 12 years, but Tiley (Philco) prevailed by persuading the Board of Patent Interference that, although Philco didn't file first, they were the first to use the method successfully in a color tube. RCA appealed the decision in 1964 to the Court of Customs and Patent Appeals. By that time, some millions of color tubes had been made and it was recognized that the invention in question was of tremendous importance. Philco exercised their right to transfer the case to the regular federal courts. A decision there would be stronger, but also imposed some risk. By this action, Philco opened up the litigation to new evidence, what the lawyers call a trial *de novo*. It turned out to be of great help to RCA in its appeal. On the other hand, the burden of proof was on RCA because of the prior Patent Office decision.

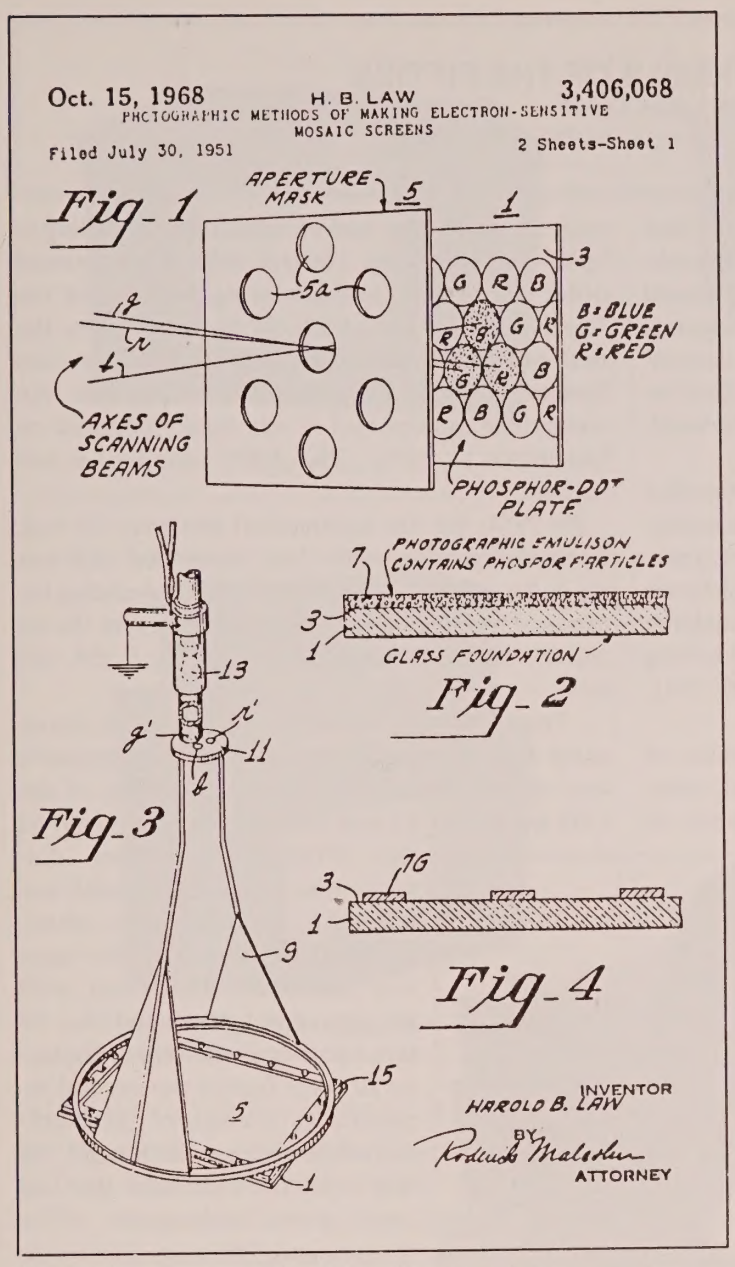
The case was set for trial in early 1966 in the federal district court in Trenton, New Jersey, under Judge Arthur Lane. I was on RCA's corporate staff at the time and was asked to be its primary expert witness, along with an expert on phosphors, Austin E. Hardy, from RCA's Lancaster, PA, facility. I had prior experience as an expert witness and had directed the 1949-50 RCA program to develop the color picture tube, giving me personal knowledge of the events during the inventive period involved. Formally, the case was called RCA (plaintiff) v. Philco (defendant) but we participants called it the Tiley-Law case after the two inventors.

Partly because of new evidence, RCA contended that Tiley did not originate the invention, but derived it from Law via a co-worker of Law, Meier Sadowsky. Sadowsky at RCA knew of Law's idea and had done work on phosphor photodeposition himself. Then, in 1949, he left RCA to join Philco, where he worked with Tiley. Before any documentation by Tiley, Sadowsky gave Philco RCA documents and information on the RCA work on photo-deposition. Further, the first recorded experiments on phosphor photo-deposition at Philco were by Sadowsky, not Tiley. The new evidence was a deposition by Sadowsky, taken after the Patent Office proceedings.

We also contended that the color tubes made by Philco/Tiley prior to the Law filing date failed to meet a reasonable test for "reduction to practice" and so Law should be awarded the patent. Law had the earliest conception date and earliest filing date. Hardy's and my main job was to prove to the Court that not one of the hundreds of tubes made with what Philco called the "Tiley process" was satisfactory. For about six months, we studied thousands of Philco records, some produced for the first time under the *de novo* trial rules. By trial time, we had exhibits and testimony ready, including the new evidence.

Philco had its defenses. Concerning Sadowsky, they claimed that Tiley had suggested the idea independently, although they had no written documentation with an early enough date, only Tiley's sworn statements made much later. As to reduction to practice, they relied on some 1951 color photographs and testimony from some of their former employees. Philco also claimed that Law's original concept was faulty because it suggested the use of gelatin, which wouldn't work. Philco used polyvinyl alcohol (PVA), a gel used by most color tube manufacturers in later years.

The trial started February 8 and ended April 7, 1966, with 31 trial days in all. I was on the witness stand for 14 days, a very long time indeed, and was subjected to grueling cross-examination. One of the telling arguments against Philco's alleged reduction to practice was uniquely my own. In RCA's 1950 color-tube demonstration, I personally took the only color pictures, and the originals had been in my possession all through the intervening 16 years. When we projected my 1950 slides to the judge, and compared them with the ludicrously inferior color pictures in the 1951 Philco records, it became clear that Tiley had not met a reasonable standard of success. This was more new evidence



allowed by the *de novo* trial. Hardy and I supported our case by a detailed study of several hundred Philco experimental tubes, using Philco's own records which described defect after defect.

When our opening case was over, Philco put on their defense witnesses, one of whom, Dr. Robert Bowie, was a retired vice president of Sylvania. He was both competent and experienced, but Philco had failed to give him the time and support which Hardy and I had from RCA. In contrast to my own six-months full-time preparation, Dr. Bowie had spent only seven days in preparing for the trial. In cross-examination, we were able to confront him with documents that Philco should have (but didn't) show him, throwing into question part of his testimony. Another Philco witness, William E. Bradley, was their former Director of Research, and his testimony had me worried. He was letter-perfect in every sentence, he recited events of 15 years before in great detail, and was unshakable in cross-examination. Each night, we'd read the day's testimony, and Bradley's read as if it had been edited by a combination of Philco's counsel and a Ph. D. in English.

The most exciting part of the trial came toward the end, in our rebuttal. During Philco's defense, they surprised us by the strength of their attacks on Law's original disclosure because it suggested the use of gelatin. We had intended to rely on textbook references showing that gelatin, gum arabic, fish glue, PVA, and many other gels were all equivalent media. But Philco's witness claimed gelatin wouldn't work with phosphors. We made some hasty phone calls to RCA's Lancaster color-tube plant to ask for help. They found an old box of common grocery-store food gelatin and, in three days, they made up several color tubes with this gel. They sent us a color set with one of these tubes. The results were so good they amazed even us; a layman could not distinguish the color pictures from those of regular picture tubes (made with PVA). On the very last week of the trial, we confidently marched the judge, all the lawyers, and Philco's experts over to our local counsel's office and demonstrated color pictures on a tube made with food gelatin!

A year later, Judge Lane issued his 46-page ruling [2] in favor of RCA on every item in contention, in so sweeping a decision that Philco didn't even try to appeal. The patent was granted to Dr. Law in 1968 [3] and gave RCA 17 years from then to collect royalties on a strong, adjudicated patent. The Court was very complimentary to Hardy's and my testimony. As to Bradley, the man with the perfect memory and perfect testimony, I needn't have worried. Judge Lane said in his decision "Bradley* * *clearly displayed an intent to color his testimony to support the contentions of his former employer, Philco. During the course of Bradley's examination, this court concluded that much of his testimony is unworthy of belief." So, perfection is not normal in mankind and, when it appears, don't believe it!

REFERENCES

1. Law, H. B., "The Shadow Mask Color Picture Tube: How It Began - An Eye Witness Account," *IEEE Trans. Electron Devices*, Vol. ED-23, pp. 752-759, 1976.

2. *Radio Corp. of America v. Philco Corp.*, 134 USPQ 570-616, 7-11-67.

3. Law, H. B., U. S. Patent 3,406,068, filed 7-30-51; issued 10-15-68.

COLOR WHEELS OF THE FIFTIES

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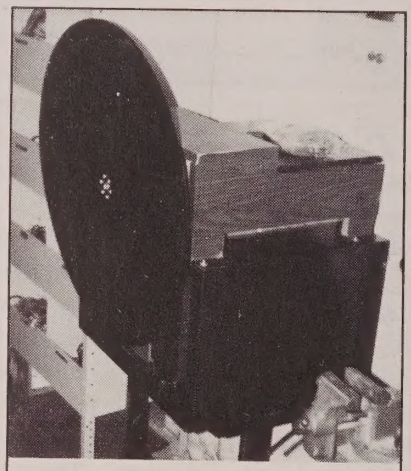
Color television goes back a lot farther than most of us think. Even back in the days of mechanical TV, the idea of adding color was pursued actively. John Logie Baird exhibited such apparatus as early as 1928. A description of that demonstration appeared in London's *Morning Post* on July 7, 1928, under the title of "Big Step Forward, Mr. Baird's Triumph."

No sooner had electronic television prevailed over its mechanical rival than efforts were underway to add color. Baird's work proved there never was any problem to producing color pictures. Combining primary colors did that. The stumbling block was how to accomplish this without doubling or tripling the required bandwidth which, by 1941, was mandated at six MHz.

CBS did this in the Forties with a version of Baird's mechanical system. A color wheel, composed of red, blue and green filters, rotated in front of a monochrome camera at the studio; while a similar but larger disc, synchronized with the camera wheel, rotated between a black-and-white receiver and the home viewer. Because pictures were produced in sequence, flicker problems required an increase of the field rate from 60 per second to 144. To stay within the confines of the 6-MHz channel, the number of lines was reduced from 525 to 405. Thus, while providing a comparatively simple way to achieve color with black-and-white equipment, the system was doomed because it was not compatible with the ever-increasing number of black-and-white sets in use.



The set as adapted

In 1946, RCA led the opposition to adopting a system that would render a million or so sets unusable. They asked for the time to perfect a dot-sequential system that would be compatible. By 1950, the pressure for color was so intense that the FCC was forced to make a decision between the proven CBS system and an evolving, but still unsatisfactory, compatible system.

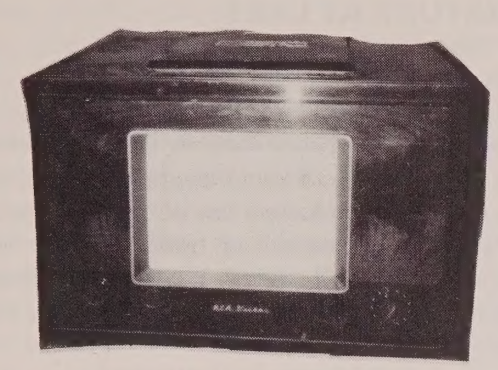
On October 10th, an order was issued, authorizing the adoption, that November 20th, of the CBS system. RCA immediately sought relief via the courts, and a stay was ordered. This litigation continued while the sales of black-and-white sets soared. By the time CBS was allowed to go on the air, there were 10,000,000 sets incapable of receiving their transmissions, and no manufacturer willing to build their color sets. In late 1951, a government order to suspend manufacturing because of the Korean conflict took CBS off the hook. For the next two years, RCA and the National Television Systems Committee continued to improve the compatible system and it was finally adopted on December 17, 1953. This NTSC standard is still with us.

By 1954, the first commercial sets were on sale. Even though the public had demanded and was ready for color, the response was disappointing because of the sparsity of color programs, and the receiver's unaffordable $1,000 price tag (1954 dollars).

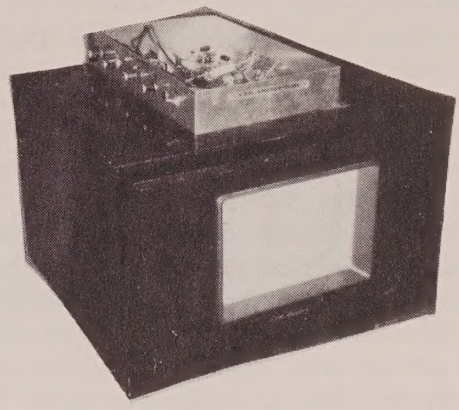
That was why, in 1955, some creative minds came up with the idea of marketing an inexpensive way of receiving color by using a version of the CBS system. A kit was offered that would convert the NTSC signal from dot-sequential to field-sequential, and with the addition of a wheel, would produce color the same way CBS did. The wheel, with two sets of red, green and blue filters rotating at 600 RPM, displayed 20 color frames per second sequentially, instead of 30 black-and-white frames interlaced, so that both the field and the line rates were unchanged. The January and February 1956 issues of *Radio-Electronics* describe the system in detail.

Col-R-Tel and Colordaptor were two small companies that offered this equipment to the public. At very little cost, good color could be obtained from a black-and-white receiver, although with some flicker. Unfortunately for the entrepreneurs, prices of electronic color sets took a nosedive, while black-and-white sets had grown in size. A 5' wheel would have been required for a 21" set! With a maximum practical diameter of 28", only a 7" or 10" set could be accommodated, and these were now on the way out. By 1958, so were Col-R-Tel and Colordaptor.

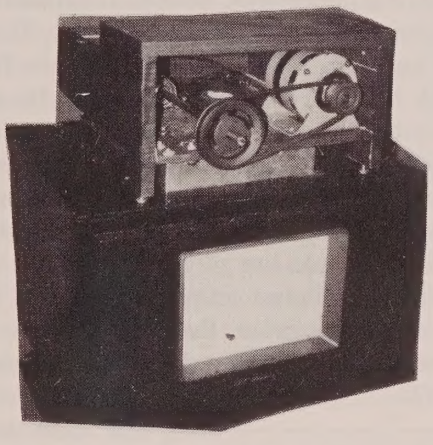
At our 1989 AWA conference, an operating Col-R-Tel highlighted the display of early television apparatus. Now that I had seen one working, nothing else would do but to have one of my own. I remembered a letter received from a chap in Massachusetts, who had bought a Colordaptor kit back in 1956, after seeing the *Radio-Electronics* ar-



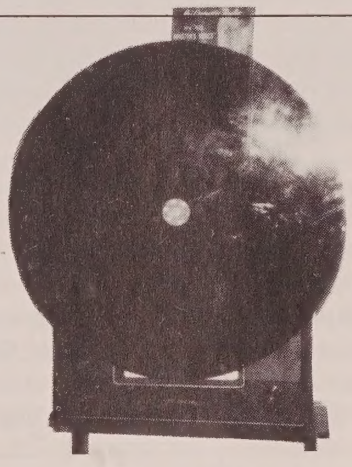
RCA 8T241



Colordapter decoder inserted



Motor and pulley assembly added



Front view - completed set

ticles. He was unable to complete it and no longer had the wheel. I acquired the kit and forwarded it to Dave Johnson, who had exhibited the Col-R-Tel at the '89 meet. Dave had an extra wheel and completed the wiring. He tested it with the RCA 630 he had used at Canandaigua, said it worked fine, and returned it to me.

When I received the wheel and the decoder chassis, I decided not to use a 630, although having one in good operating condition, but rather an RCA 8T241 table-model. In my opinion, this was the best-performing 10" black-and-white set of the Forties, and it had a great-looking cabinet. It lent itself perfectly to the project, as its top section, on which the speaker was mounted, was the same size as the decoder chassis. After removing the speaker, I put the decoder in the speaker space and it was a perfect fit. There were some modifications to the receiver circuit that had to be made, after which I built a platform on which to mount the drive motor, belt-driven reduction pulley, shaft and color wheel.

I placed this platform atop the set, and positioned it so that the bottom of the wheel lines up with the center of the receiver screen. This made for compactness and the additional advantage of viewing the picture from a six o'clock position, rather than three o'clock, as happens with a 630. I added sides to the platform, to conceal the mechanical components, while still permitting access to the decoder controls (see pictures). Lastly, I topped the assembly with the speaker section I had removed to make room for the decoder chassis.

This completed the project and it is quite presentable. For those who are interested in adding a similar device to a good black-and-white receiver, Peter Yanczer, of Tesla Electronics, who has helped with information for this article, is now producing color discs for either 7" or 10" sets that sell for $139.95, including construction details. Write him at 835 Bricken, St. Louis, MO 63122, if you want to get into an excellent "science fair" project or have a great addition to your radio or television collection. I can certainly recommend it to you.

[Antique Electronic Supply also offers a 23" color wheel and information on building the converter unit. - Ed.]

TRANSISTOR RADIOS -- MATURE AT LAST

Henry B. Cohen ("Mister Transistor")
2459 Eighth Street, Fort Lee, N.J. 07024
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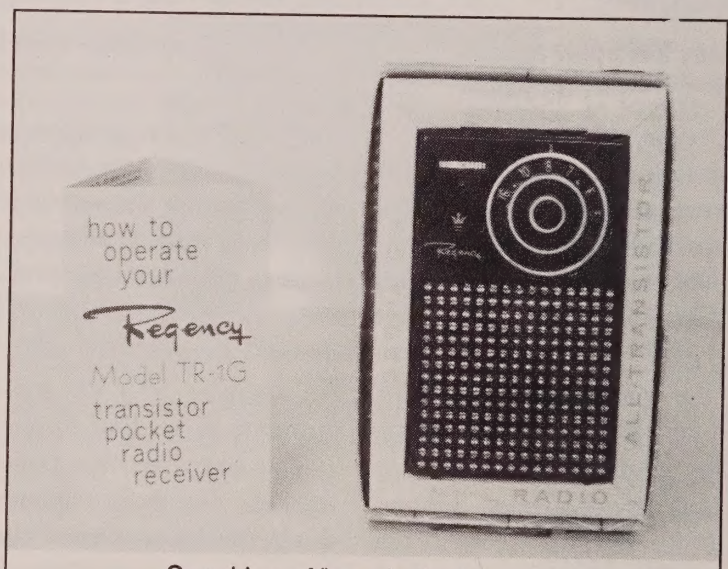
WHO'S ON FIRST?

There's lots going on in transistor collecting that you should know. Before the shocking news, however, a few words about the author of this article. I am a professional writer, former magazine editor (*Video*), patent-holder, ex advertising executive, and a forty-year radio hobbyist. Who cares? You do because I bring an entirely new perspective to antique radio reportage and collecting, especially transistor collecting. Before reporting, I analyze all the variables impacting these sets from an engineering standpoint and a marketer's point-of-view. That said, let me open your eyes and possibly help fill your wallet.

GOLD IN THE ATTIC

A few months ago, a single transistor radio was reportedly sold for $5000. (As an aside, I know the seller and his word is gospel to me.) That is the cost of about five AK breadboards. And if you think the sale was a fluke, I have personally sold single transistor radios for as much as $2500 plus. Aside from mind-boggling prices, other factors merit your attention. The collecting population is basically dichotomized as follows. One group comprises traditional collectors who have been at it for many years. These people expect to pay little money for their sets ($5 to $35 is the norm) and usually amass many hundreds or even thousands of radios. They prefer to trade rather than buy, they almost always refuse to sell outright, and they tend to be clannish. They are the "boys club" of transistorland. The second group of collectors constitute the new kids in town. Most are thirty-something, want to buy, want the sets to work, are frustrated with the Old Guard which is keeping them out, and are the future of transistor collecting. These people, some of them women, bring new blood to the hobby and should be treated with appreciation, not disdain. A few even collect both novelty and traditional transistor radios, although most specialize in one or the other. For you tube types who don't give a picofarad about transistor radios, consider this. If you possess a few of the highly prized plastic guys, you can sell or trade them for what you really want. Restored, near-mint, midrange transistor sets go for upwards of $150 apiece; high-end set prices reach the stars.



Speaking of "new in the box" . . .

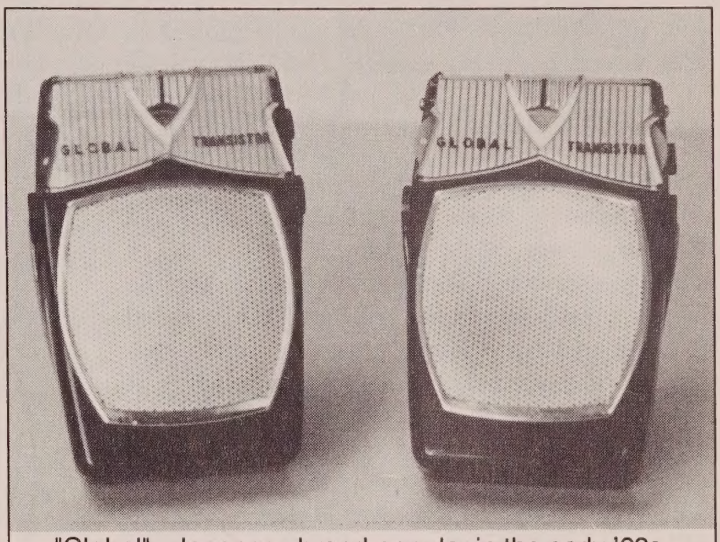
TARGETING TRANSISTORS

Let's get specific about makes and models. The cardinal radio is the Regency TR-1. As with other sets, but in this one case to a lesser degree because of historical importance, condition followed by color followed by condition is everything. The lowest prices currently asked for TR-1s by the few who will sell hover around $300 for basic black. The two marbleized sets, mahogany and green, fetch the big bucks, especially the latter. Plain green (an olive-drab shade) is also extremely rare and commands incredibly high prices. Red and white sets are fairly common but grays are not. For a highly collectible new-in-box set with papers, you can just about name your price. Second to the TR-1 in importance, and even more difficult to obtain, is the Sony TR-55. Only a few are in collectors' hands at this time as these were produced in tiny quantity (some report only 2000 but nobody is certain) and never officially imported into the U. S. The Sony TR-63 is also a hot set but drops to the $250-750 range, depending on color and condition. All solar-powered radios, especially Hoffman Solars, fetch hundreds of dollars, as do the earliest Raytheons -- the second company to market transistor radios. And, again, a new or mint in-box set can probably get you a good used car in trade.

The value of packaging (original boxes and papers, etc.) is a major factor among transistor collectors. A pair of unused TR-1 boxes were sold several months ago for $75 and would have gone far higher had the seller known their true value. Carrying cases are beginning to come into their own; many early ones were made of fine leather, and add a great deal of interest to the sets.

MAKING A CASE FOR VALUE

Since collectors display their radios on shelves in great quantities, this precludes placing them in their cases. But when they go to sell or trade, having a mint set in its case adds considerable value and a degree of charm. And for some sets, like the Zenith 500 series, the case protects them sufficiently to allow their intended use (portability) without much chance of damage. Miniature and subminiature tube portables are frequently collected by the transistor mavens, as are "cheap" 1950s plastic-cased crystal sets. Prices vary but are almost always condition-dependent. Only the TR-1 gets the bulk of its value from history -- it was the first. All the rest are popular because of reasons known only to the gods and the vagaries of a fickle marketplace.

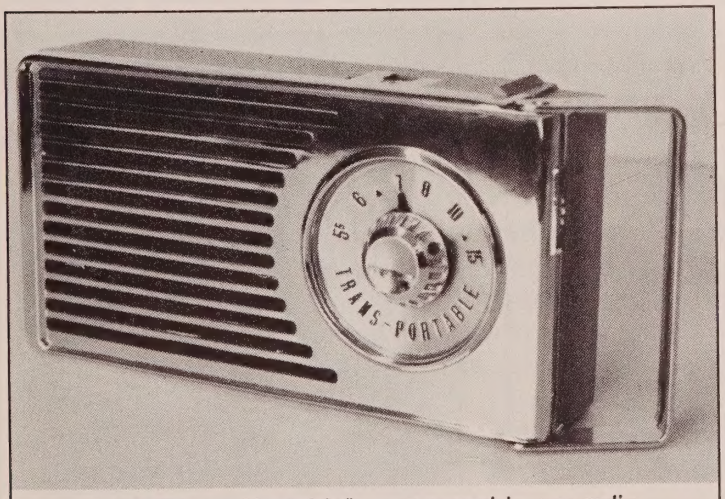


"Global" - Japanese brand popular in the early '60s.

Many collectors currently disdain Japanese sets (even if they carry an American brand name), favoring only those made here. As a result, most early American (except for RCA and GE) sets are in great demand. There are still outstanding bargains among the Japanese products but this is slowly changing. Therefore, if you can get your hands on the early Japanese sets cheaply do not hesitate for a moment. Grab 'em before someone else does.

RECAPPING FOR A MOMENT

Repair and restoration of small transistor sets is possible. I recondition about thirty sets per week, sometimes more. The only secret I will give away, and the most important, is that you must replace *every* electrolytic in the set. This is not a "shotgun" approach as our illustrious editor has called it. It is, instead, common sense. Just because the caps are small and operate at low voltages doesn't mean they won't go bad. They do in virtually every case. Since there are usually five caps to a six-transistor set, replace them all. Don't waste your time trying to analyze a circuit in a set not designed for servicing. Replace the caps and you'll restore about ninety percent of these sets. The other ten percent require further expertise and these are my secret.



Buick "Trans-Portable" - a removable car radio.

Having said this, it is my hope that the traditional radio collector will now unearth a few valuable transistor sets. I don't care if you like them or not. I just want you to know that they are worth something, and in some cases a small fortune. This knowledge is good for both of us, although some collectors will no doubt put a contract on my head.

OLD AGE IS THE RAGE

Currently, sets made after 1963 are not worth much but should increase in value over the next few years. Whether radios made in countries other than the U. S. and Japan will ever achieve greatness is for the futurists among you to decide. I think not, save perhaps for a few novelty sets. Transistor radios are different from all other categories of receivers because of the great numbers made of almost every model. And because it is almost essential that the first example of each manufacturer be owned by every "serious" collector. Catalins and their brethren are sought for their beauty, wood sets for their type, style, sound and rarity. But who among you must own the first commercially produced tube set, crystal radio or Catalin?

In future articles I will wax specific about various sets but always within some parameter. Whether by type, solar for example, or by year or by manufacturer, I see no reason to rehash what is available in any TSM (Sams' Transistor Service Manual) or advertisement.

GRADING THE MAKE

In judging overall radio "quality," no standards exist among collectors at this time. Tradeoffs are

(Continued on p. 52)

THE LOUDSPEAKER

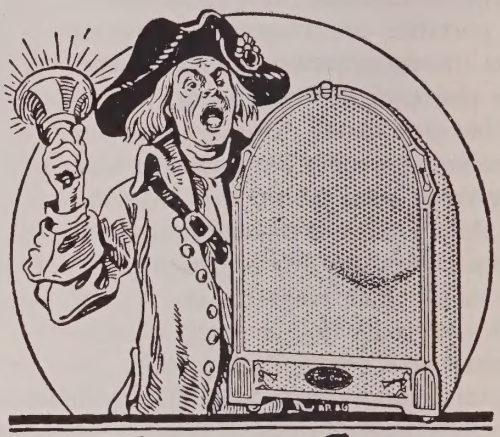
EDITED BY
FLOYD PAUL, W6THU
1545 Raymond, Glendale, California 91201
All correspondence requires SASE for reply

GALE RADIO LABORATORIES

A *cement* horn speaker? In April magazines of 1925, including *Radio News*, *Radio Retailing* and *Popular Radio*, Gale Radio Laboratories of Chicago announced that a new horn speaker, the "Town Crier," was being marketed. Ads noted that the speaker was cast of a composition containing cement and several other ingredients, it was heavy enough to resist vibration, and the horn would not ring. The horn supposedly had 21" of air column. The first units were finished in crystal brown or crystal mahogany. Retail price was $17.50; west of the Rockies, $18.50. Ads mentioned the non-tipability feature, or "Not easily overturned."

One superlative used to describe the unit's tone was "The voice that thrills." Other descriptions were "small, compact, sturdy, vibration-proof, devoid of wooden or metallic sounds." Within a few months such other finishes were being advertised as golden polychrome and green polychrome. Although the author has found other horn speaker manufacturers using such diverse materials as tin, steel, iron, porcelain, glass, papier-mache, fibre, wood, copper, plastics, and others, none used cement as Gale Radio Laboratories advertised.

The horns pictured are in the Bill Smith collection; photos furnished by him.

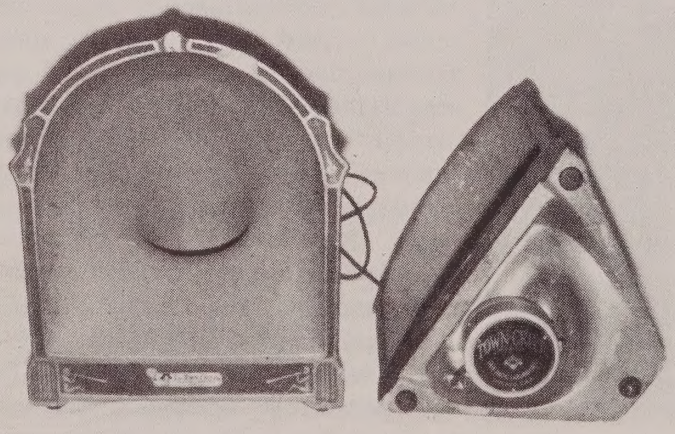


The TOWN CRIER
Radio's Most Beautiful Speaker

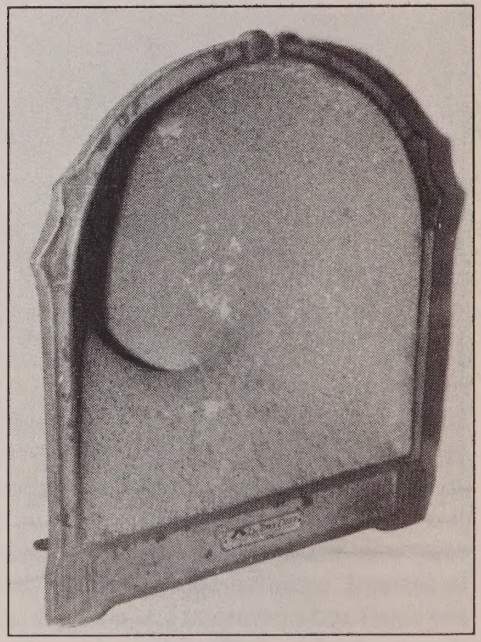
$17.50 LIST PRICE
West of the Rockies $18.50

Circulars describing the Golden Polychrome and Green Polychrome models of the Town Crier sent upon request.

GALE RADIO LABORATORIES
2516 Irving Park Blvd., Chicago



The nameplate on lower front of the lefthand unit bears the same "crier" logo as the magazine ad. At left and right of the nameplate are figures of horn blowers.



THE 1992 AWA CONFERENCE

Ludwell Sibley, AWA Press Corps

The conference for 1992, our 31st, was another success. Attendance was comparable to last year's, with 600-plus members and their spouses/guests adding up to somewhat over a thousand. The foreign attendance included members from Austria, Brazil, Canada, England, Germany, Italy, the Netherlands, and Sweden. Some of them (for example, Alan Carter from Britain, or Bengt Svensson or Anders Widell from Sweden) were here for the fifth or sixth year.

THE FLEA MARKET. The ever-capricious weather made itself felt, with intermittent showers during the unofficial "gray market" on Tuesday and then on Saturday. At midweek, however, the climate was magnificent and activity was bustling.

This year's practice of preassigning flea-market spaces brought a certain amount of order that was lacking in earlier years. There was high early demand for space, which the hotel relieved by opening new grassy areas in addition to the parking lot. As a result, there was no shortage. (There was a moment of angst at the start: maps of spaces had been drawn up in July and used for assignments, but meanwhile the hotel staff had resealed the parking lot, restriping it with fewer spaces!)

A surprise appearing in this year's market was a 1903-vintage Thomas Clark coherer receiver. A wide variety of high-quality goods - from rarities to commodities - was available.

PROGRAM. Lauren Peckham lined up a fine array of sessions. Bart Lee led a seminar for SWLs, with displays and audio playbacks. Marty Bunis gave an insightful talk on the evolution of radio case styles from the 1920s to the transistor era, covering the subtleties of industrial design. In line with this year's "General Electric" theme, Dwight Jones of GE presented the history of a variety of GE electrical and electronic products, centering on early solid-state development. Bruce Kelley gave a general entertainment show. He and Marshall Etter ran another informed session on old-time amateur radio. Bruce also presented an overview of telegraph and wireless "brasspounding" history, with not just slides but audio recordings of a high-speed Morse wire and of spark transmitters.

John Anderson, well known historian specializing in GE, then sketched the Twentieth Century activities of that company in radio-electronics. He gave a thoroughly enjoyable program despite having a huge bulk of material to cover in limited time. Robert Miller next described the history of magnetron and dynatron oscillators as developed by A. W. Hull of GE, with the results of extensive recent measurements of the negative-resistance characteristics of old-time tubes. Then Tom Lewis of Empire of the Air fame covered the life and career of W. R. G. Baker, one-time GE vice president and IRE president.

EQUIPMENT CONTEST. Ralph Williams organized another thematic contest based on, of course, General Electric. A variety of GE-based displays were present, plus those on "classic" old-time topics. Besides the regular contest displays, we were treated to Peter Yanczer's operating 30-line disc TV system, complete with a Mickey Mouse figurine on a rotating pedestal as the test image, and to Ken McIntosh's display on Western Television disc broadcasts in Chicago.

MUSEUM. Besides its regular weekend schedule, the AWA Museum was open on Wednesday, both on a morning special-bus and an evening drive-yourself basis. The evening session was quite popular.

BOOK FAIR. The book fair was expanded to two full days this year, with six vendors doing a brisk business. Two books were introduced at the conference: AWA Review Vol. 7 and George Metcalf's Making Waves in the Information and Space Age.

AUCTIONS. Ed Gable's auction of communications equipment on Thursday was somewhat smaller this year than in 1991, but quality remained high and prices were realistic. A surprise was a 40-years-old Hallicrafters SX-62, looking as if it had just come out of the box. The three auctions on Friday were of "normal" size, less the big estate that strained them last year. However, a smaller estate clearance was included this year. The book auction resulted in some *extraordinary* bargains on group lots of rare titles. Starring in the tube auction was a comprehensive collection of Western Electric tubes, with 100+ types spanning WW I to the Fifties. In the main auction, this was the "year of the crystal set," both home-made and commercial. Quality stayed high, with prices tracking the desirability of the sales items. Top pieces were a De Forest DT-700 and DT-800, a tasty Tribune Air-Phone three-box set, a WW I trench receiver, a John Firth set, etc.

BANQUETS. The Equipment Awards banquet included Barry Beck demonstrating the tricks of an old-time sound-effects man. Garry Yoggy and the Elmira Little Theater recreated a 1948 "Duffy's Tavern" network show. The main banquet on Saturday featured George Metcalf, one-time klystron developer and former head of GE Aerospace, covering his early career.

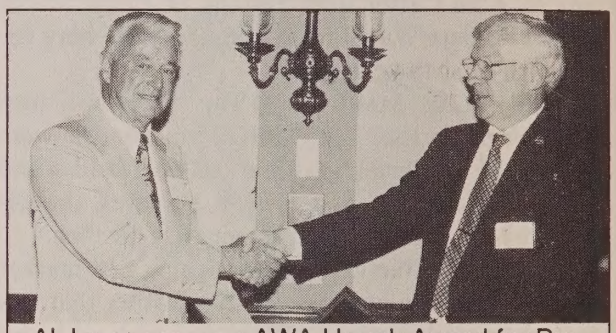
AWARDS. Besides the Equipment Contest awards listed on page 33, several individuals received

awards. The Taylor Award went to David Johnson for efforts in preserving television artifacts. The Cundall Award was presented to Parker Heinemann, W1YG, for his success in this year's Old-Time CW Contest. The AWA Houck Award - Documentation went to Tom Lewis for Empire of the Air, while the AWA Houck Award - Preservation was given to Al Jones, K6DIA, for his comprehensive collection of transmitting tubes. Bill Fizette received the President's Award for conference management, while the BK-OTB Award was presented to Robert Murray for his article "Voice of the Prairie" in the August *OTB*. Award winners since 1973 are summarized on page 34.

OTHER MATTERS. This year's day trip took advantage of the great weather on Friday, going on a Canandaigua Lake tour boat to Naples, New York, with lunch and a tour of the Widmer winery.

The Conference for 1993 will again be at the Marriott, September 22-25. The number for hotel reservations is (716) 359-1800. The special theme will be "Westinghouse."

John Anderson presents AWA Houck Award for Documentation to Tom Lewis.



Al Jones receives AWA Houck Award for Preservation from Ray Hutt of the Smithsonian.

COMMUNICATIONS-EQUIPMENT AUCTION

Ed Gable, K2MP, Auctioneer

Eldico SSB-100 transmitter, book, exc. 110
Elmac A-54 mobile transmitter, exc. 22
Hallicrafters receivers
- Echophone Commercial EC-1, VG 30
- S-20R, good 39
- S-38, VG, copy of book 38
- S-38E, exc. 26
- S-40A, good, copy of book 42
- S-40B, VG, book 28
- SX-24, VG 45
- SX-25, copy of book, VG 60
- SX-62A, exc./superb, copy of book 305
- SX-100, VG 85
- S-120, exc. 32
- 5R21 Continental, exc. 42

Hammarlund receivers
- HQ-129, reworked, clean 80
- HQ-140, VG 60
- SP-200 Super Pro, good, PS, spkr (loose), cabinet 160
- Speaker, 8", 1940s, exc 26
- Speaker, for PRO-310, good 27

Heathkit
- AR-3 w/QF-1 Q-multiplier, VG 28
- DX-100 transmitter, good, light mods 25
- HD-11 Q-multiplier, exc., book 8
- HO-10 monitor scope, good, book 41
- HR-1680 rcvr, exc., book 53

Lafayette
- 6-m/2-m VFO 4
- HA-52A VHF-FM receiver, good 5
- "Lester" 6-10-11 m. converter, good 11

Lettine 240 transmitter, exc., book, all coils 65
Military/Naval - Command Sets
- BC-454 rcvr, converted 5
- BC-455B rcvr, Colonial, dirty but original 11
- BC-696 xmtrs (RCAF), orig. (2); BC-454B rcvr (modified), w/PS 50
- R-445/ARN-30 navigation rcvrs, w/dyn. 5, 5
- T-19/ARC-5 xmtr, good, no lid, book copy ... 19
- T-21/ARC-5 xmtr, good, no lid, book copy ... 25

Military/Naval - General
- BC-779A Super Pro, Howard production, lightly modified, w/cabinet, no PS or top cover 45
- LM-18 freq. meter, orig. PS & cables, good .. 12
- RAL-5 receiver, less meters and PS 21

Morrow mobile converter, good 5
National receivers
- HRO, early (S/N R66), new meter, good, seven coilsets, no PS, copy of book 145
- NC-101XA, meter added; otherwise good .. 215
- NC-183D, exc., commercially modified to Northern Radio 141 90
- NC-300, scruffy but OK 70
- SW-3, exc., no PS, 1 extra pair coils 250

RCA ACR-155 receiver, VG 110
RME miniature-tube preselector, exc. 10
Stancor 20P transmitter, exc., book 120
Stancor 112T 2-½ m transceiver, fair 11
World Radio Labs 680 Globe Scout, good 20
World Radio Labs 755 VFO, good 17

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THE AWA REVIEW, VOL. 7

- Ricevitore Popolare Italiano (The Italian People's Receiver)
Robert Lozier

- Memories of Early Electron-Tube Development
Edward W. Herold

- The First High-Power Transmitter at Poldhu
Desmond Thackeray

- Secret Tubes for Radar: The Western Electric 700-Series
Ludwell Sibley

- Appendix - Production of VT90 (710A) in Valves in Australia
Colin MacKinnon

- Military Electronic Equipment - Naval Equipment Manufacturers
Fred Chesson

- A Brief History of the Valve Audio Amplifier
Carlos Fazano

- The Eaton Tube Collection Revisited
Jerry Vanicek

- The Arc Method of Producing Continuous Waves
William J. Byron

- Robert H. Goddard and the Goddard Oscillator
M. D. Hall

- The Evolution of Broadcasting from the Transmitter Viewpoint
Author unknown - photos from John Anderson; edited by Ludwell Sibley

- Index and Additions to Patents Lists
David Kraeuter

Volumes 1, 2, 3, and 6 are also available, as are a wide variety of *OTB* back issues. For details, see p. 7 of the Nov. 1992 *OTB*.

TUBE AUCTION

Bruce Roloson, Auctioneer

24A (4) 6
26 (3) 8
27 (6) 9
50, "S" bulb (2) 46
Arcturus Blue
124 (3), good 22
127 16
27 (2), good 36
Lot of 11 62
Audiotron and Myers Audion
Both open 50
Audiotron open; Myers OK 75
CGR X-ray, rotating-anode .. 35
CRTs, 5" (2) 13
Cunningham
381, 281; box and papers 10
C-11 36
C-299 (6) 30
C-300, OK 11
UV-201 (2), brass, tip, OK .. 36
De Forest
"Audions" (3), good 37
CF-185, fil. OK 250
DL-5 18
DV-2 36
DV-2, OK 51
DV-2, OK; DL-2, OK; DV-5, open; Raytheon BA 29
DV-3, open 9
DV-5, good 27
DV-5, new old stock 30
VT-21, open 55
Spherical Audion replicas
Good 150
Damaged 30
De Forest, Mullard, McCullough
DL-2, DL-3, DV-5, D.06, 401 etc., all OK 48
Display duds, brass-base (4) .. 20
Eimac (5 small glass) 14
Eimac 100THs (2) 21
Electronic Enterprises EE-1, OK.1
European (5) 22
GE CG-38161 (861), open 27
GE FP-2, open 25
GE TB-1, WW I regulator (4), boxes (5) 40
Geissler, in clear liquid 160
Hitachi 2M121A, magnetron ... 4
Light bulb display, small 70
Marconi VT, open 25
Marconi-Osram silica types
NT54, good 240
NT90, bad seal, good fil 210
Marvin 401 16
Mercury rectifier 24
Mercury-arc rectifier, Cooper Hewitt 205
Metal tubes, "Original Nine," good, in display 37
Miscellaneous lots
BA, BH, WD-12 brass; WD-11 brass (2); all OK 140
Unidentified 160
Metal; VT-1, OK; Moorhead (2) open; VT-14 OK; TB-195
PJ-2, 2A3, 10Y, UX-222, 30; OK in boxes 26
Small X-ray, odd Tungar, SY-210, CX-350, et al., all OK 41
UV-201A brass, VT-2, C-300, Airline 201, etc., all OK .. 115
WD-11, brass, open; WD-11 bakelite OK; UV-201A, OK, etc. 52
Moorhead Solenoid, fil. OK 220
Northern Electric (3), good, two in new box 20
Octals (100+), unboxed 30
Philco, Zenith, etc., NIB (8) .. 18
Philips Miniwatt
19 425, OK 8
A21, OK 9
A409, OK 7
E415, OK 8
E443, OK 4
QRS Red (5), 2 in orig. boxes, 3 loose 100
Raytheon
Kinolamp, disc-TV tube 100
RK20 9
RK28, 814, 807 16
RCA
810 w/socket 13
Tube display boxes (5) 4
UV-199 (4), brass, tipped, open 22
UV-199, UX-199 (2) 26
UV-200, brass tipped, UV-201s (3), two tipped 26
UV-201As, brass, good 16
UV-203A, NIB 24
UV-876 current reg., good 7
WD-12 brass, tipped
(3) open 30
(1) new old stock 30
REL1/VT90, 8025 (5) 5
RV2D800 German mil. (2) ... 14
SN4 strobe tube 5
Speed Triple Twin 295, OK 52
Taylor 866 Jr.(2), Taylor (?) (2)
Transmitting tubes, mounted in display, cond. unk. 55
Tungar bulb, good. 6
Tuning eyes (5), OK 35
UV-199 (12), UV-201 (6), all duds 27
UV-199, brass, UX-199, UV-199 bak. base, all OK 80
UV/UX-199, UX-200, UX-201A, etc., all OK 59
UX-199 (27), misc.duds 36
UX-201A, all OK. (16) 61; (20), 110
UX-245, UX-201A, 112A, etc., all OK 30
Volutron Type A, OK 20
VT-46A/866A, (2) old stock in new box 5
VT-42A/872A, (2) old stock in new box 5
Weagant Valve 400
Welsh 501, Sodion S-13, etc. 200
Welsh Peanut Tube, Radio Research Guild 240
Western Electric
102D, good 30
102F, good 10
211E, good ..... 26, 2 (!)
251A, open 20
276A, good 4
279A, good 40
300B (3), good 310
VT-1 (2), good 60
Collection of >100 types ... 625
Lot, 101D, 239-A, also WX-12, 201A (2) et al. [all OK] 50
Photocell 32
Westinghouse
Mazda projection lamp, T10
500-watt 1
857B, minor crack 29

Prices in the Tube, Literature, and General auctions are actuals, taken directly from the accounting computer. They include items that a member buys back but omit items where bidding does not reach a reserve level.

LITERATURE AUCTION
Bruce Roloson, Auctioneer

1909-1959 Radio Club of America commemorative, Radio Girls, tube manual, et al. 55
1927 Radio Reference Map, 1928 Canadian radio license 10
4000 Years of Television, Hubbell 17
ABCs of Vacuum Tubes, The, 1922 7
Admiralty Handbook of Wireless Telegraphy, 1931 20
Antique Radio Classified, 58 issues 25
ARRL Radio Amateur's Handbook, 1935 18
Catalog, American Sales Co., 13th Anniversary. 10
Catalog, Central Scientific Co, 1937 21
Catalog, De Forest K 95
Catalog, Uncle Dave's Radio Supply , '30s 6
Day-Fan Service Manual 23
Electric Motor Repair 11
Electrical Experimenter 1914 (several) 45
Electrical Maint. and Repair, 5 vols. 1913-25 10
Emile Berliner, Maker of the Microphone, 1926 50
Foreign Conspiracy Against the US 20
History of Eng. and Science in the Bell System .. 21
History of WFBM 20
Manual of Wireless Telegraphy, MESCO, 1920 .. 65
Marconi Wireless News Telegram, 1915 14
Modern Practice of the Electric Telegraph, Pope, 1875; An Elementary Manual of Radiotelegraphy and Radiotelephony, Fleming, 1908; Electrons, Lodge, 1913; et al. 160
Modern Radio Reception, Leutz, 1928 25
Modern Radio Servicing, Everyman's Guide to Radio (5 vols.), ICS handbooks, et al. 110
OTB, 43 issues 40
OTB, 60+ issues 1964-80 51
OTB. 1960-68, 4 w/index 8
OTB. 1968-72, 4 w/index 8
OTB. 1974-79, 4 w/index 7
Popular Science, ca. 12 WW II issues 7
Practical Radio Const. and Repair, 1927 3
Principles of Electricity Applied to Telephone and Telegraph Work, 1938 11
Proceedings of the IRE, 4 issues 1928-31 4
QST 1921-23, 21 issues 38
QST 1924-25, 23 issues 32
QST 1926-27 26
Radio News, 1920-32, 12 issues 24
Radio News, 1932-43, 11 bound vols. 130
Radio Simplified, 1927 14
Radio Simplified; Tom Swift's Wireless Message; Radio Boys Search for the Inca Treasure; Modern Radio Reception, Leutz, 1924; et al. 130
Radio Troubleshooters Handbook, Ghirardi 5
Radio, 1936-42, 54 issues, good cond. 45
RCA Victor Manual 1931-32, Vintage Radio, 1972, et al. 55
Rider's indexes, Vols. 11-13 (4 lots) 6, 3, 1, 1
Rider's Vol. 1 30
Saga of the Vacuum Tube, AWA Review 1, MESCO Catalog, et al. 100
SCR-274N manual, repro 21
Zenith Radio Service Manual
Vols. 1 & 2 combined 25
Vols. 1 & 2 35

GENERAL AUCTION
Bruce Roloson, Auctioneer

ADVERTISING

Arvin sign, cardboard 34
Booklets, Study Radio, Philco Training Guide for Dealers ... 10
Eveready B-Battery sign, cardboard 32
Farnsworth banner, 1940 45
Puppet, Charlie McCarthy, cardboard 29
RCA Service sign 310
RCA-logo neon tube, ST bulb, screw base, working 240
Zenith electric sign, reverse-painted, late 40s 180
Zenith Radio sign, 1' x 2' dual-sided 45

AMPLIFIERS

Accurate resistance-coupled 75
Bogen integrated mono 29
H. H. Scott 99 mono, no case ... 25
Western Electric 7A 220
Western Electric 25B, book 180

COMMUNICATIONS EQPT.

AN/CRT-3 Gibson Girl xmtr, w/book, case, kite 100
RT-196/PRC-6 FM handie-talkie, VG cond. 60
BC-312M, scruffy but orig. 45
BC-611 AM handie-talkie 110
Western Electric 20A aircraft receiver, ca. 1935, exc. 330

CRYSTAL SETS

AGA Kristallmottagare, Sweden, 1926 310
Beaver Baby Grand, box 330
De Forest Everyman, no case 150
Federal Junior 290
Homemade (7) 13, 40, 50, 50, 55, 85, 100
Lightright Flivver (1925) 95
Philmore Black Bird 110
Radio Fone 170
Spenser Pocket Radio 110
Star Radio, less galena 230
Steinite 160
Unidentified (3) 70, 80, 210
Unidentified, Vienna, Austria. 90

KEYS AND TELEGRAPH

Electrobug 110
Signal Corps J5A WW I 27
Signal Electric relay, 2 small relays, KOB, glass battery jar . 100
Svanström educational key and register, Sweden, 1900 210

Western Electric 3A repeater ... 100
Western Electric 3B sounder 11

METERS

Audio freq. meter, RCA 306A . 1
Ballistic galvanometer (2)...50, 55
Battery tester, RCA WV-37A ... 6
Clark Tone Tester, WSA 180
Lineman's test set, WE 17C 21
Oscillator, RCA TMV-97B RF ... 18
Voltmeter, Mowbrey 5

MICROPHONES

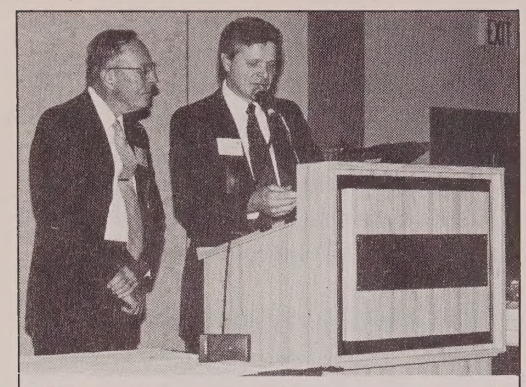
RCA, Turner, Astatic (5) 130
Shure 520SL, late 40s 9
Universal 110
Western Electric carbon, ring mount, floor stand 310
Western Electric 4A horn-type carbon 50

MISCELLANEOUS

American Instrument Co. mercury relay 20
Annunciator 120
Apollo medical machine with accessories 35
B-battery, Philco storage, 24 V. 12
Cabinet Glorytone 5
Cabinet, GE wall tube 26
Clock, Westinghouse Catalin... 30
Dummy load, Ohmite 100-watt . 8
Electrical/radio test set 250
Loop antenna, DTW (Deutsche Telefonwerke), beat up 90
Loop antenna, Lincoln 80
Majestic power supply (2) .. 12, 12
Microphone, semi-auto key, variocoupler, Baldwin phones.... 180
National Co. plug-in coils, 10... 95
Parts, Edison motor, 1 tube detector and amp unit 19
Power supply, Stromberg-Carlson 401-A 26
Replacement socket 110
Shipping box, for RCA Balanced Amp. 36
Variable condenser, General Radio 7
Variable condensers (Murdock), telegraph key, sounder, etc.... 70
Wireless game, early 1920s with dice 30

RECEIVERS, TUBE

Acradyne (Freshman Masterpiece clone), AFT changed.... 40
Ampliflex 6, fair, no tubes 45
Atwater Kent
10C breadboard, tags 800
33 65
40 41
80 350
Bendix 115, Catalin-like 120
Blaupunkt portable 30
Canadian Marconi trouble finder, 1930 120
Clapp-Eastham RADAK R4, no tube 300
Crosley
5-38 reflex, orig. cond. 80
52 110
525D, painted, no tubes 115
5M3 Superhet 45
C 519-A 25
Canadian Trirdyn 100
Pup, w/WX-12 and phones .. 350
Trirdyn, exc., no tubes 90
Trirdyn 95
V tuner and IV amplifier 360
V w/brass-base 201A 140
Cutting & Washington 11A, book 900
DeForest (w/tipped tubes)
DT-700 Radiohome 1200
DT-800 amplifier 1100
Delco 3205 32-volt farm set 36
Dovenshire 55 60
Emerson
AU190 butterscotch Catalin. 790
520 95
in Ingraham cabinet 26
F. J. O'Neil Onondaga Five (Freshman Masterpiece clone).... 80
Fada 192A Neutrolette, exc.... 130
Federal B-20 TRF 30
Firestone 5-7425-6 55
Firth 235-A w/phones, no tube, fair 650
Freed-Eisemann
FE-28 70
NR-80, 1 dial gone, no tubes 9
Freshman Masterpiece, internal-horn model, no horn or tubes 45
Frost-Minton, 4-tube, metal 41
GE 408, works 4
GE 60 clock radio 4
GE E-61, hums 85
Grundig 102W AM-FM 5
Hallicrafters
S120 25
Sky Buddy 50
TW-1000A 41
5R31 Continental 30
Home-made
2-tuber, chestnut cabinet 20
7 tubes, 3 meters, 4 dials 340
1-tube SW 40
Kellogg RFL500 chassis 90
Kingston 2-tuber, nice 40
Lansdowne Majestic whiskey-bottle TRF 130
Luxor Gallery, Swedish 70
Magnavox battery set 80
Majestic 20 cathedral 85
Mohawk 6 tube TRF 15
National Airphone
Monodyne (2) 110, 160
Somerset 5A TRF, no tubes .. 55
Oliver Tone 1570 95
Philco
37-620, semi-cathedral 55
42-PT87 10
46-1201 radio-phono 45
9-506 27
84 cathedral 60
Pilot FM Pilotuner 20
Radio Guild 2-tube TRF, no tubes 180
Radio-Matic, coin operated 8
RCA
Globetrotter 21
R7N Tombstone, wkg 60
Radiola 17, cabinet poor, no tubes 30
Radiola 26, good 475
Radiola 28, with loop 90
Radiola 60 (2) 55, 70
Radiola RS 450
Radiola V 300
Victor 8X54, exc. 13
Scott (chasses; no cabinets)
Phantom Deluxe FM w/PS, VG chrome, speaker open 240
1931 two-dial, no PS, poor chrome 65
Imperial, w/spkrs; no PS; chrome fair 230
Silvertone
Deco tombstone 60
100359 26
16 5
8210, works 25
Sparton
10 tombstone 50
400 110
AC 63 65
Blue mirrored glass, small.. 1400
Stadardyne 5-tube TRF, cabinet fair, no tubes 25
Thermiodyne TF6, no tubes 40
Tribune Air-Phone, three-box, three-tube, w/tubes 330
Tuska Superdyne 300, less AFT 170
Unidentified tombstone 45
Victor VV-IV crank phono.... 150
Victoreen superhet, good..... 500
Westinghouse
Aeriola Sr., dials scruffy, dud tube 130



Bill Fizette receives President's Award from Bruce Roloson.

When license plates on cars in the lot say "RADIOS," "E H SCOTT," or "UX-201-A," you know there's action.

Aeriola Sr., ... 150
Zenith
6G001Y portable..... 15
6S321..... 110
7G605, first Transoceanic..... 60
8G005..... 40
Transoceanic, later, no handle.. 30

RECEIVERS, TRANSISTOR

Bush TR130, British 25
GE P1871A 4
Hacker Sovereign, British 40
Loewe Opta..... 40
Perdio, British, 1964 16
Standard Micronic Ruby..... 51
Zenith Royal 2000 AM-FM.....23

SPEAKERS

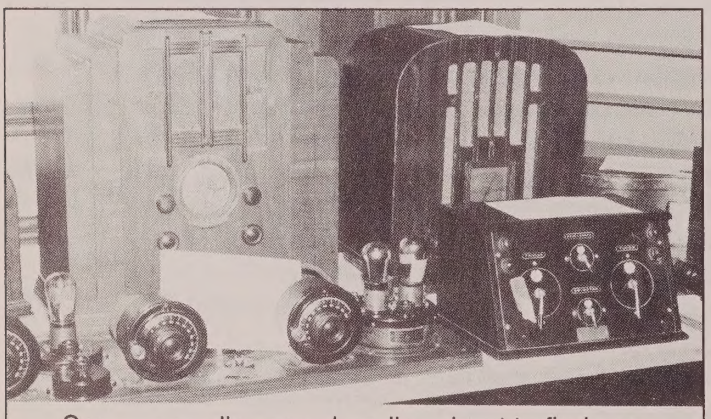
Baldwin small horn (ca. 3").....220
Bristol Audiophone Jr. 160
Burns horn, exc. 220
Majestic horn 110
Operadio.....60
Philco, 3" chrome case.....8
RCA Radiola 100.....41
Stewart-Warner cone, dancing-girls motif 130

TELEVISION

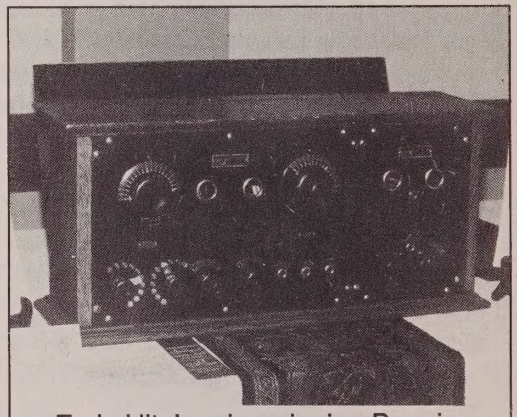
Magnifier lenses (2).....16, 30
GE 806T w/book, 1948 65
Pilot TV-37 3-inch 230

WIRELESS EQUIPMENT

Loose coupler, Murdock 240
Receiver, slide-coil, from Murdock/Clapp-Eastham parts. 270
Spark coil, Central Scientific. 550
Spark coil, Robinson & Sons, ca. 1890 290
Tesla coil, Central Scientific.... 23
Tuner, Johnson & Phillips Mk III, WW I trench set w/2 dets., repro case and labels..... 1900
Wavemeter, Marconi No. 2, WW I, less coils..... 760



Some appealing merchandise about to find new owners in the auction.



Ernie Hite's prize-winning Premier Electric receiver display.

Ralph Williams delivers the Display Award to Robert Murray and Robert MacIntyre.

In the auction bidders' faces, you can read it all: desire, hope, pain, jubilation, greed . . .

OLD-EQUIPMENT CONTEST

Ralph Williams, N3VT, Organizer

Class 1 - **GE Commercial Equipment**

First: Peter De Angelo - Thomson DC Watt-Hour Meter *(brass-framed, glass-cased Victorian-era instrument)*

Second: Orval Parker - Instrument Display *(GE meters over the years)*

Third: Tim Walker - "A Tale of Two Meters"

Class 2 - **GE Tubes**

First: Floyd Jury - Development of the All-Metal Receiving Tube *(with 58-year-old development samples)*

Second: John Parsons - GE Tubes and Sockets

Third: Herbert Waterman - From Thyratron to SCR

Class 3A - **GE Receivers, 1920s**

First: Lauren Peckham - Hull Kenopliotron Receiver *(development prototype - see Oct. 1990 OTB for full details)*

Second: Robert Murray and Robert MacIntyre - Canadian GE Broadcast Sets *(Radiola I and III as local variants - with the box!)*

Third: Robert Lozier - Origins of the Radiola V *(Filaments glowing and all - see QST, June 1922, for more)*

Class 3B - **GE Home Receivers, 1930s**

First: Ross Smith - Model A-53, Original Tubes *(More of those early metal tubes)*

Second: Doug Houston - Model A-82 (1936)

Third: Clay Seidel - Model M-40, RCA for GE

Class 4 - **GE Receivers, Post - WW II**

First: Mike Raide - Model 140 Portable

Second: Frank Feczko - Disneyland clock

Class 5 - **GE TV**

First: George Freeman - The Weather Girl *(Mid-Forties studio scenes at WRGB-TV, and a taped interview with Marilyn Arms, early TV personality)*

Class 6 - **GE Military Equipment**

First: Ken Blakeman - 40 Years of Radar *(AN/FPS-6 to -117)*

Second: Will Jensby, Wavemeter

Class 7 - **GE Documents or Advertising**

First: Robert Schaumleffel - GE's Radio Stations *(WGY, W2XCW, W2XAD, etc.)*

Second: Tim Walker - Tube Spec Sheets *(Original blueprinted graphs)*

Third: Peter Yanczer - Metal-Tube Paperweight *(Original 6H6)*

Class 8 - **Passive Receivers**

First: Larry Babcock - Marconi CM-294C

Second: Clay Seidel - Radiola I/ER-753A

Third: Bengt Svensson - The Listener, E. R. Phone

Third: Ross Smith - Long-Wave Crystal Set

Class 9 - **One- & Two-Tube Receivers**

First: Gordon Symonds - 1926 ARRL Handbook Homebuilt

Second: Bob Dennison - Camper's Companion

Third: Billy Richardson - Cockaday Four-Circuit

Class 10 - **Three-Tube Receivers**

First: Ron Frisbie - Melodyne *(A breadboard with AK circuit modules and WD-11s)*

Second: Billy Richardson - Detroit Rec. Horn

Class 11 - **Four- & Five-Tube Receivers**

First: Ernie Hite - Premier Electric *(Prototype regenerator-plus-three-stage, ca. 1921)*

Second: Peter Yanczer - Wurlitzer M-4

Class 12 - **Six- or More Tube Receivers**

First: Lloyd Swackhammer - Stromberg-Carlson Chairside

Second: Billy Richardson - Victoreen Superhet *(Another nice restoration)*

Third: Frank Feczko - GE Model 202

Class 13 - **Tube Transmitters**

First: Bob Mattson - Utah Junior

Second: Mike Raide - Gates Exciter

Third: John Rollins - Push-Pull Oscillator *(Want to make your own? See p. 37.)*

Elle Award: Gordon Symonds

Eunice Thompson Award (Best in Show): George Freeman

Matlack Transmitter Award: Mike Raide

Display Award (Best Presentation): Robert Murray and Robert MacIntyre

Judges: Floyd Bennett, Geoff Bourne, Alan Douglas, Orval Parker, Ross Smith, Ralph Williams

"Apprentice" Judge: Gordon Symonds

Administration: Ralph and Elinor Williams

The Melodyne, as in Mel Comer.

Photos: Richard Ransley

AWA AWARDS and RECIPIENTS

YEAR	TYNE TUBE	ELLE CRAFTSMAN	THOMPSON	TAYLOR
1980	Patrick Dowd	Alan Douglas		
1981	John Stokes	Robert MacIntyre		
1982	Lauren Peckham	Lincoln Cundall		
1983	William Condon	-	Ralph Muchow	
1984	-	Mike Katzdorn	J. & F. Kreuzer	
1985	-	Ross Smith	Lauren Peckham	Ken McIntosh
1986	Alan Douglas	A. C. Stoddard	Alan Douglas	Richard Brewster
1987	Rüdiger Walz	-	J. & F. Kreuzer	Edmund Taylor
1988	Bill Orr	Bob Murray	Michael Payne	Stephen Hofer
1989	-	Billy Richardson	Floyd Jury	Peter Yanczer
1990	Gertrude Tyne	Lauren Peckham	Mike Katzdorn	Arnold Chase
1991	John Anderson	-	Jim McKinnon	Pat Leggatt
1992	-	Gordon Symonds	George Freeman	David Johnson

YEAR	CUNDALL OT CONTEST	AWA HOUCK - DOCUMENTATION	AWA HOUCK - PRESERVATION	
1974	W2LV/W0TRF	Lou Moreau	Warren Green	
1975	W1DM	William Breniman	Stuart Davis	
1976	W1DM	Howard Schrader	Wayne Nelson	
1977	W1DM	Ralph Williams	Vance Phillips	
1978	K4TS	Don deNeuf	Lauren Peckham	
1979	W1DM	Ivan Coggeshall	Joseph Pavek	MATLACK
1980	W2LV	Lloyd Espenschied	Ralph Muchow	William Shaw
1981	K4TS	Alan Douglas	John Caperton	-
1982	K4TS	-	Fred Hammond	John Haught
1983	W2LV	Kaye Weedon	Patrick Dowd	Bill Hurni
1984	K4TS	Floyd Paul	Rex Matlack	A. C. Stoddard
1985	K4TS	Hugh Aitken	Ralph Williams	-
1986	W8VSK	Bill Fizette	-	James Miller
1987	W2BJI	John Nagle	-	John Rollins
1988	W1YG	Don Patterson	Bob Lozier	John Rollins/Marshall Etter
1989	W2VDI	Bob Morris	Bruce Kelley	Neil Wiegand
1990	W2ER	Morgan McMahon	Charles Dachis	Bob Mattson
1991	W2ER	John Anderson	Bob Paquette	John Rollins/Parker Heinemann
1992	W1YG	Tom Lewis	Al Jones	Mike Raide

YEAR	DISPLAY	PRESIDENT'S	BK-OTB
1986	Franz Mock/John Glisson		
1987	Max de Henseler		
1988	Bill Fizette		
1989	Robert Lozier	Helen Kelley	
1990	Jerry & Marsha Simkin	Richard Neidich	Jack Kingman
1991	Floyd Jury	Dexter Deeley	Lloyd Espenschied
1992	Robert Murray/Robert MacIntyre	Bill Fizette	Robert Murray

Awards use these criteria: **Tyne Tube**, honoring Gerald Tyne, for contributions to preserving or documenting the history of tube technology; **Elle Craftsman**, in memory of Bruce Elle, W2VTR, to a builder of high-quality communications equipment of old or new type; **Thompson Best of Show**, in honor of early amateur Eunice Thompson, W1MPP, for an entry in the equipment contest at the Annual Conference; **Cundall Old-Time Contest**, in memory of Lincoln Cundall, W2LC, to the winner of the AWA old-time CW contest; **AWA Houck - Documentation** and - **Preservation**, to remember Harry Houck, radio developer, for achievement in documenting radio development/history or in collecting/documenting radio artifacts on a noncommercial basis respectively; **Matlack**, via support of Rex Matlack, W3CFC, for excellence in constructing or restoring amateur equipment; **Taylor**, in memory of John Taylor, RCA television developer, for preserving TV history; **Display**, for quality and informational value in an exhibit at the equipment contest at the Annual Conference; **President's**: chosen by AWA's president, for outstanding service to the Association; **BK-OTB**, via support of Bruce Kelley, for the outstanding original *OTB* historical article of the award year.

EARLY EQUIPMENT PROFILE

EDITED BY
LAUREN PECKHAM
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All correspondence requires SASE for reply

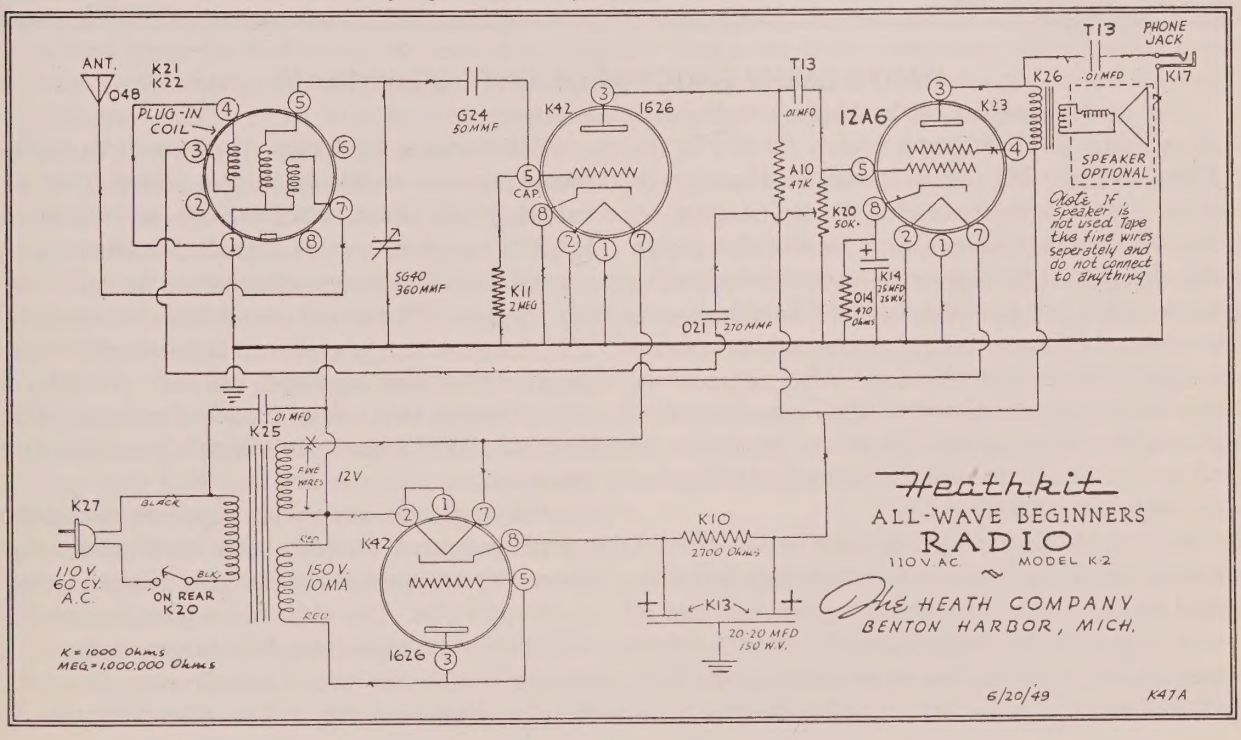
BUILDING THE 1949 HEATHKIT K-2 RECEIVER

Many collectors of early radio equipment learned the basics of electronics through the medium of various kits that were offered through the Heath Company catalog. In my case, Christmas seasons were very enjoyable, as my parents knew my favorite gift would be something that required a few days for assembly.

Shortly after WW II ended, I received my first radio kit, the Artone Jr. Everything was mounted on a plywood base, and the first step in the instructions covered the mounting of several Fahnestock clips. No doubt the manufacturer of the kit assumed 11-year-old boys weren't to be trusted with a soldering iron! The "work bench" was usually my mom's card table and I was allowed to demonstrate the completed product in the living room, next to the Christmas tree. I still have the 1D8GT vacuum tube and a curious two-gang variable capacitor, probably left over from some military application. The tube burned out years ago, but I can't seem to throw it away.

The K-2 today, with shortwave coil.
Richard Ransley photo.

A few years later, Heathkit offered a three-tube all-wave set. My good friend, Dick Ransley, has kindly loaned the original instruction folder for the K-2. It is dated 6-20-49, so Dick probably showed me an ad for the set later that year. We each built one; mine was a gift at Christmas. Being in a rush to try the new receiver, I worked faster than was sensible. After a quick check of the wiring, the set was switched on. The result was total silence. My dad noticed that the tube heaters were not lighted. Once the connection from pin no. 2 of each heater was completed as shown in the pictorial, I was rewarded with plenty of output from radio station WHAM; all 50,000 watts! Of course the transmitter in Rochester,



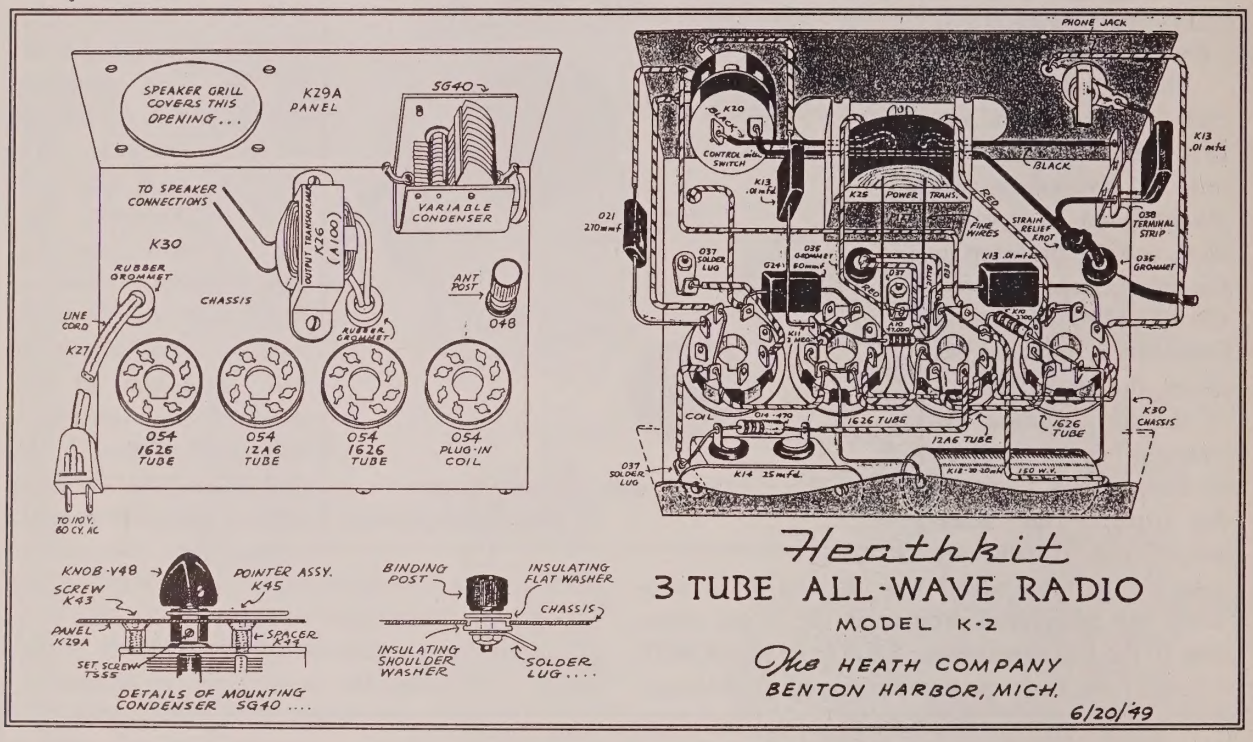
NY, was only 30 miles or so from my home in Sodus. One can assume the odd-ball tube line-up - military JAN-1626 and JAN-12A6 tubes - had to do with the tons of surplus available following WW II - specifically, spares for AN/ARC-5 radios. Remember those packages of resistors, capacitors, and multi-deck rotary switches that one could purchase for, say, $3.25?

However, the Heathkit contained better-grade components, and the two plug-in coils covered the broadcast band and a portion of the amateur 80-meter spectrum plus [then-]police, aircraft and foreign services. Regeneration, controlled with a potentiometer, was tricky to adjust on the short-wave band. The optional 2-½" speaker worked fairly well on local broadcast stations.

I still remember using plenty of soldering paste, everywhere possible. Of course we soon learned that the stuff left a residue that eventually corroded everything in sight!

The K-2 chassis was supplied at a cost of $8.75 and my folks decided that this amount was about maximum for my "best" present that year. Remember, this was in 1949! Extras included the speaker at $1.95 and a mahogany cabinet that could be had for $2.95.

Both Dick and I still have these sets, and they have become treasured pieces in our antique-radio collections. It's sad to note that the Heath Company will no longer be producing kits. Perhaps the little K-2 will become another collectible from the vacuum-tube era.



HARPS SHOW SUCCESS DESPITE DOWNPOUR

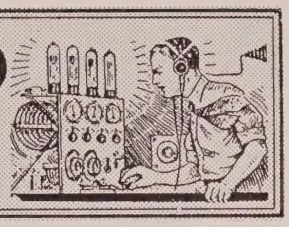
For many members of the Hudson Valley Antique Radio & Phonograph Society (HARPS), the Third Annual Old Time Radio & Phonograph Show started a day early, on Friday, August 14. The weather had taken a turn for the worse, with rain forecast. The show organizers who decided to set up tents and canopies for their outside booths were busy Friday evening, placing tables and arranging radios and phonos. After a meal of chicken wings and chips at 11 PM, someone asked if all of the direction signs were up. Oh dear! So off go two of us, returning to our vehicles around midnight for some sleep.

At 3:30 AM our first prospective buyers arrived, waking us all up. Considering that they had traveled from Canada, they were forgiven, but told to wait until 8:00 like everyone else! At 5:00, fellow club members and dealers began arriving. By 8:00, all our vendors were set up and collectors were everywhere.

There was a full range of items, from radio-phono consoles to Victor horn machines, plus advertising collectibles, tubes, records, and cylinders. HARPS members put on several demonstrations, among them a flame speaker having no coil, magnet, or cone. The sound comes from an oxyacetylene flame. Also played was a binaural phonograph, where two cartridges on one arm play a record having two sets of recorded grooves. One member played a beautiful Victor V complete with oak horn.

Although the downpour began at noon, the crowds just kept coming. Our buyer count was above 500, and dealers weren't able to pack up until almost 4 PM. The show was a great success for all. Now, to start planning for next year's show . . . See you there! For info: Linda Gramm, Box 1 Rt. 207, Campbell Hall, NY 10916. [Geoff Shepherd]

AMATEUR RADIO



EDITED BY
BOB & MIKE RAIDE, W2ZM-KA2RLK
Box 181, Bloomfield, NY 14443
All correspondence requires SASE for reply.

Father-and-son team Bob, W2ZM, and Mike, KA2RLK, will head future AWA old-time activities, particularly next February's OT Contest. Bob is owner and chief engineer of Class B FM station WKLL, while Mike services satellite receiving equipment. Both can be heard on the low bands using OT phone and CW transmitters. And now for the QSO Party . . .

1929 QSO PARTY

'29 VINTAGE EQUIPMENT

Friday, November 13, 6 PM EDST, to Sunday, November 15, 6 PM EDST

Forty-eight continuous hours of operation will provide greater opportunity for W5s-6s-7s-0s to work the East Coast. Who will make the first transcontinental contact with a transmitter from the Twenties?

The 1929 QSO Party is open to members using transmitters of 1929 or earlier vintage, of the self-excited type: TNT, Hartley, etc. The power input must be less than 10 watts. Participants are encouraged, but not required, to use straight keys and regenerative or other vintage receivers.

Send "CQ AWA." Make as many contacts as possible with other members. Exchange RST, power input, and year vintage for the transmitter. Send a copy of your log, citing equipment used, to Bud Hall, K2LP, Box 974, Eastham, MA 02642.

A PUSH-PULL TUNED-GRID TUNED-PLATE OSCILLATOR, 1929 STYLE

John F. Rollins, W1FPZ
Star Rte. 2, Box 150, Arrowsic, ME 04530

INTRODUCTION

Early last fall, Parker, W1YG, piqued my interest in 1929-type self-oscillators when he showed me an early article on building a push-pull transmitter of this type. His stated intention was to build such an oscillator for the "1929 or earlier" AWA contest coming up in November.

Self-oscillator circuits of 1929 vintage come in several types, the best known of which is the single tube TNT (tuned-plate, untuned-grid type). Other common ones are the Hartley, the single-tuned plate, tuned-grid, and the push-pull oscillators. The common tubes of the day were the 45, the 210, and of course the 852 - if one really wanted to generate some power.

Having never built a push-pull oscillator, I proceeded to delve into the various aspects of the problem using a tuned-plate - tuned-grid (TPTG) circuit. The first attempts followed the conventional circuits shown in the 1930-34 ARRL Handbooks using the 45 or 210 tubes. The results, while they may have met the amateur requirements of that era, left something to be desired under today's crowded band conditions. The chirps and yoops were quite impressive. Obviously more research was needed.

After several weeks of experimentation the end product has turned out to be quite satisfactory, and the result on the air is a surprisingly clean, stable DC note. I feel prompted to pass this information on to other members of the AWA in hope that a few more push-pull oscillators will come on the air for either the November or the February AWA contests.

The accompanying circuit is quite straightforward, and can be found in the 1930-34 ARRL Handbooks, as well as several early issues of *QST*. Only some of the component details and operating parameters have been changed, in an attempt to improve the quality of the signal.

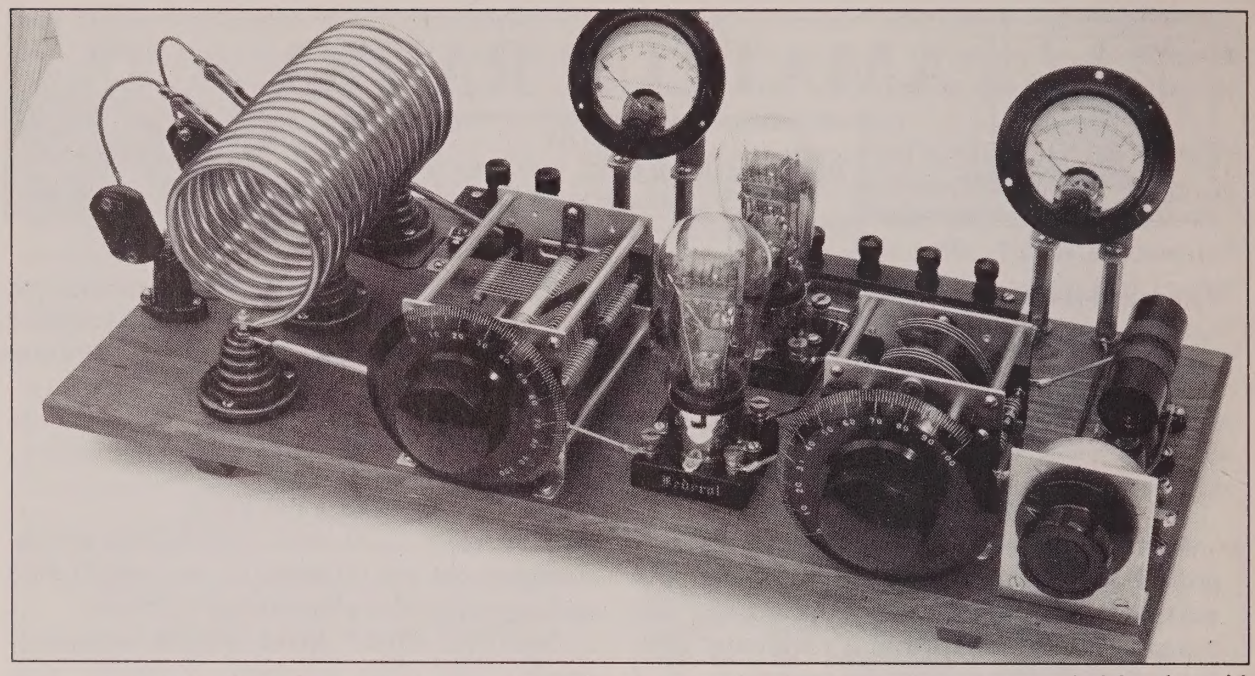
TUBES

Most early low-powered oscillators used the 45 or 210. Either may be used here. The 210 is much more flexible in power output; it may be driven up to about 30 watts with a good power supply. However, the 7.5-V filament may require more flea-market digging to produce the transformer. The 45 uses a 2.5-V filament transformer which is generally easier to find. The comments in this article pertaining to tuning, loading, and voltages, apply for the most part to either tube.

GRID CIRCUIT

Some of the early circuits used an untuned grid circuit. However, past experience has convinced me that a tuned grid provides much more flexibility and ease of moving about the band.

The grid tank circuit uses a low-C capacitor. This is a departure from the early days when high



C was favored in the grid as well as the plate circuit. A dual 100-pF capacitor works well and is easy to tune, acting much like the bandspread condenser in some receivers.

Finding authentic "period" dual-stator condensers may take a little patience at the flea market, but in the meantime a more "modern" Thirties model, such as a Hammarlund dual-stator receiving type or a National TMS, will work nicely. In the transmitter illustrated, I used a single-stator National DX receiving capacitor of fine pedigree, and modified it to a low-C dual stator. This requires only making three additional insulated mounting blocks to separate the two stator sections. The capacitor can then be reassembled with three stator plates mounted on each frame end plate, attached through their respective insulating blocks. Three rotor plates per section, properly spaced to mesh with the stators, complete the job.

The beauty of using the National DX-type capacitor is that the old National Type A vernier dial may be mounted directly to the capacitor frame, which greatly facilitates tuning.

The grid coil form is 1" in diameter and 3-¼ inches long. If you cannot find an old 1", or so, bakelite coil form, a good substitute is 1" diameter Delrin plastic rod, black, which may be bored out with a 3/4" drill. The result will look quite authentic. Banana plugs are mounted at each end of the form, and also one in the center. Finding the old green double-silk-covered (DSC) wire may be a bit of a challenge, but as an alternative one can use #26 nylon-covered wire and dye it green. This wire can be supplied by RADIOKIT. Three glazed standoff insulators, brown in color for period authenticity, with banana jacks, complete the assembly.

The RF choke can be anything handy. One of the early, universal-wound RF chokes would be authentic. A rheostat is recommended for the grid bias circuit. A 50K wirewound unit is the best, but a 25K or 30K variable, with a fixed resistor in series to make up the total 50K, will do. Mount the rheostat on a piece of 1/8" aluminum plate for rigidity.

A 0-20 or 0-30 milliammeter is strongly recommended in the grid circuit. This will allow you to adjust the grid current to about five to eight mils. Too high a grid current will encourage chirp in the oscillator.

PLATE CIRCUIT

Finding a dual-stator, 500-pF per section plate tuning condenser may take some ingenuity and/or rummaging at the flea market. Fortunately there are several alternatives to the problem of acquisition. Fair Radio Sales sells a dual Cardwell capacitor which has one section of 25-485 pF and one of 23-427. One of the stator plates in the higher cap section can be easily cut out with a hacksaw, making the two sections equal at 427-427 pF. A little more coil inductance will be required with this lower cap (see coil winding data). Occasionally the old General Radio dual cap, 500 pF per section, can be found. These are very good. Also the old Cardwell balanced-rotor dual-500 turns up occasionally.

If one has access to a small metal-turning lathe, a very nice dual 500-pF variable can be made up from two National DX 500 single capacitors (see photo). A new rotor shaft will have to turned, and also a spacer sleeve to separate the two rotor plate sections. The shaft needs to be about 5-¼" overall, and the spacer sleeve about 3/4" long. Four new tie rods will have to be made. These should be 4.4" long, made from ¼" diameter rod, tapped at both ends for 6-32 machine screws. Each stator section is mounted on the respective front and back end plates through three insulating blocks. Again, a

National Type A dial can be mounted directly. A number of the early circuits show a single-ended plate tank circuit with a push-pull oscillator. Don't even try it! The oscillator will chirp wildly.

The plate-tank inductance may be made in several ways. To be authentic, the coil should be wound of ¼" copper tubing. A piece of 3" PVC pipe or a heavy cardboard tube will work nicely as a mandrel. As an alternative to copper tubing, a section of 3" Air-Dux coil, four turns per inch, will work nicely (see coil data). The finished coil should be mounted on three brown-glazed beehive insulators.

Coupling to the antenna, or to an antenna tuner, may be accomplished by tapping directly off the coil through blocking capacitors, or by the use of pickup coils on each end of the tank coil. Pickup coils seemed to be the most common method in those days. These coils were generally made of three or four turns of ¼" copper tubing, with one end of each coil fastened to a beehive insulator, so that the coils could be swung out to vary the coupling. I chose to tap onto the tank coil. Two Sangamo micas, 0.005 or 0.006 μF, do the job. Twisted-pair lamp cord can be used to tie to the antenna tuner.

A "proper" plate RF choke should be wound on a ½" diameter wooden dowel 3-½" long. A three-inch winding of #26 or #28 DSC wire makes an effective choke. Again, #26 nylon-covered wire dyed green will closely approximate green DSC .

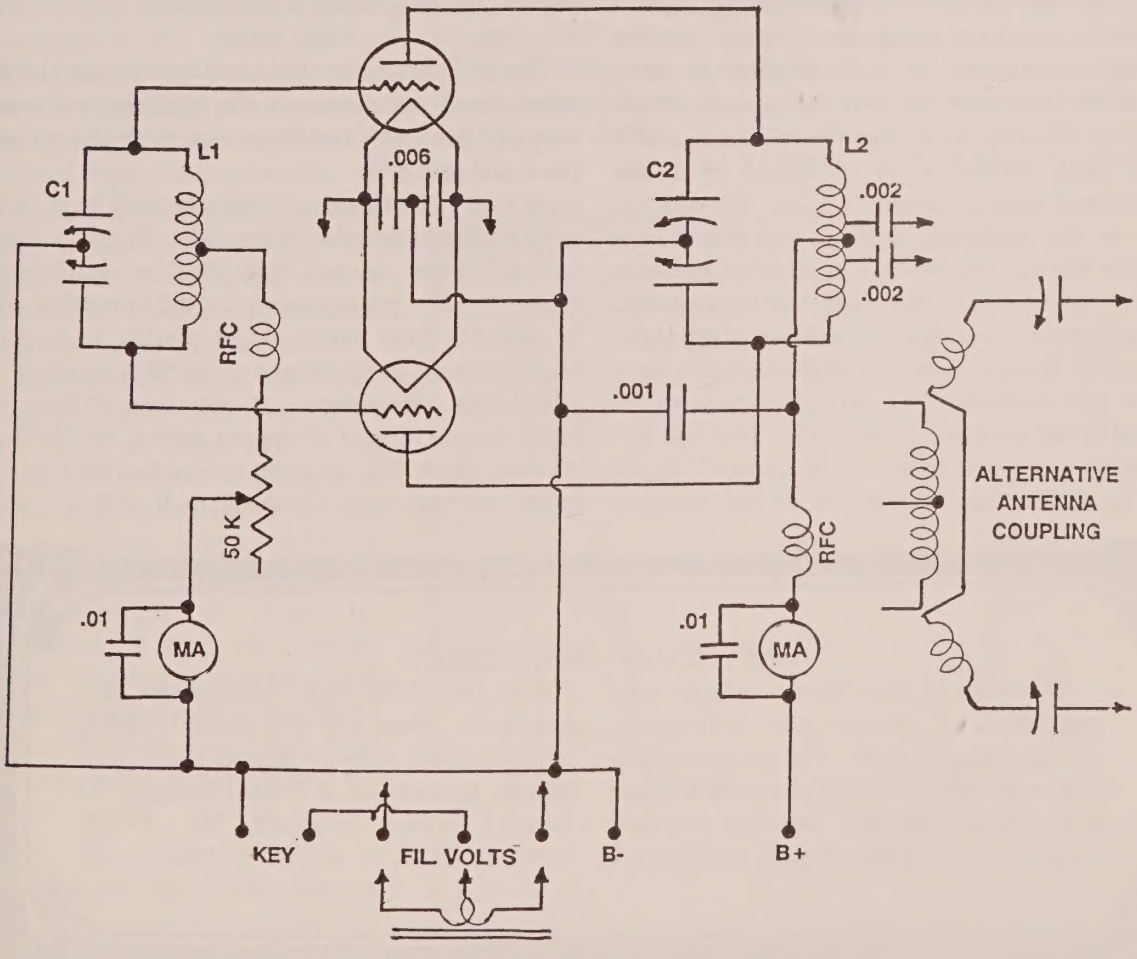
CONSTRUCTION NOTES

Any type of "breadboard" may be used. Be sure to use rubber bumper feet on the underside corners. Make construction and wiring as rigid as possible.

Hand-capacity effect is a "given" with these self-oscillators, and can make precise tuning troublesome. The hand-capacity effect is in large part due to the hand disturbing the fields surrounding the two coils when you reach up to tune either capacitor. However, the effect can be greatly reduced in the grid tank circuit, which will help final frequency adjustment.

Mount the grid coil 3 or 4 inches back from the front of the breadboard. Then mount the grid bias control, with its aluminum mounting plate, at the front of the breadboard, on center line with the axis of the coil (see photo). When making the mounting plate for the rheostat, be generous with the dimensions of the plate (3" high, 2-½" wide is a good compromise). The plate will partially shield the coil from the hand.

The grid and plate meters should be given some attention to rigidity in their mounts. The four mounting posts, 2" long, can be made from ½" diameter aluminum rod. Drill and tap both ends of the rods for 8-32 screws. The rods or posts, are



PUSH-PULL TUNED-GRID/TUNED-PLATE SELF-OSCILLATOR, 1929 STYLE

fastened to the breadboard from underneath. Four pieces of aluminum 1/8" thick x 5/8" wide x 3-¼" long form the two pairs of mounting brackets. Bend a right angle foot on one end of each piece, and drill each foot to pass an 8-32 screw. The opposite end of each piece should be drilled " to accept the terminal bolt of the meter. The pieces may be bent back to tip the meters slightly upward. This makes a fairly rigid mount. Electrical leads are connected at the bases of both mounting posts.

POWER SUPPLY

A few notes on the power supply for the oscillator may be helpful. A good supply will contribute greatly to a clean note from the oscillator. The transformer should have at least a 200-mA rating on the high voltage secondary. It should be capable of 400 to 500 volts DC for the 210 tube, and 350 to 400 volts for the 45. A higher voltage and a light plate loading will contribute significantly to a chirp-free signal. The filter choke should be rated for 150 to 200 mA with corresponding low resistance. A heavy bleed across the DC output will help regulate the supply. A 15K ohm, 100-watt resistor is recommended. A light duty power supply will give poor regulation, and contribute to chirp in the oscillator.

TUNING

A grid-dip meter is helpful in initial tuning of the oscillator, but a receiver can do the job. Using a GDM, set both the plate and grid tuning capacitors for the middle of the 80-meter band. Set the grid bias resistor at 35K to 40 K ohms to start, then switch the power on with the antenna circuit uncoupled from the tank. Key the oscillator, and it should show resonance, as evidenced by a low plate current reading (about 10 mils). Set your receiver on the frequency desired, and slowly vary the plate tuning. No doubt a number of spurious "birdies" will be heard, but when the fundamental is tuned, the receiver S-meter will swing off scale. Then adjust the grid capacitor to show five to eight mils of grid current. The antenna may then be coupled to the oscillator plate tank. This will immediately move the signal off-frequency. However, by alternating adjustments of the antenna tuner and grid capacitor one can bring it back to the desired frequency. Load the oscillator to 20 to 50 mils, depending on the power desired, and keep the grid capacitor to 5 to 8 mils grid current. If a good DC note is not heard in the receiver, increase the capacitance of the grid tuning, and readjust the grid bias resistor to maintain the 5-8 mils grid current. Loading may be increased as desired within limits of the regulation of the power supply. With a well regulated 500-volt supply, the plate circuit can be loaded to about 70 mils for a pair of 210 tubes before any chirp appears. Loading can be adjusted via the antenna coupling system to meet the "under 10 watts" requirement for the 1929 QSO party. A 400-volt power supply, with 20 to 24 mils loading, works nicely for this requirement.

Once the oscillator is fully adjusted on the desired frequency, you will find that you can easily move up or down 10 kHz by varying the grid capacitor. The plate capacitor will not need touching. A wider frequency excursion will require resetting the plate tank, and the grid capacitor may have to be readjusted to maintain resonance.

I must acknowledge that all that I have written here is "old hat" to the real old-time hams in AWA, but it is hoped that this article will be of interest to those of us Johnny-come-latelies, 68 years and below! Good luck, and if I can be of help to anyone, please give me a call or write.

COIL DATA

The coil data presented here covers only the 80 meter band, but if desired, the oscillator will work very nicely on 160 and 40 meters, with the proper plate and grid coils.

Grid Coil - 80 Meters: 1" diameter coil form, 3-¼" long bakelite, or other material. 56 turns close wound, center tapped #26 DSC or equivalent. Note: If other parameters are used in making coil or coils for other bands, adjust winding to let grid capacitor tune to resonance about 50% meshed.

Plate Coil - 80 meters: 3" diameter, 6" long, 16 turns, center tapped ¼" copper tubing, or Air-Dux 3" diameter 4 TPI, 16 turns center-tapped (use 18 turns Air-Dux with Cardwell dual 427-pF cap).

NEW CLUB - NEW JERSEY

The state of New Jersey, with its high population of antique-radio enthusiasts, now has its own club. The group held its first swapmeet this Fall, centrally located in Freehold. Regular meetings are held on the second Friday of each month, at 7 PM at the VFW Hall, Waterworks Rd., Freehold. Dues are $10 yearly - check payable to NJ Antique Radio Club. For details, the contact is Tony Flanagan, 92 Jaysan Terrace, Freehold, NJ 07728, (908) 462-6638.

KEY and TELEGRAPH

EDITED BY
LOU MOREAU
W3WRE

MORE ON THE NEEDLE TELEGRAPH

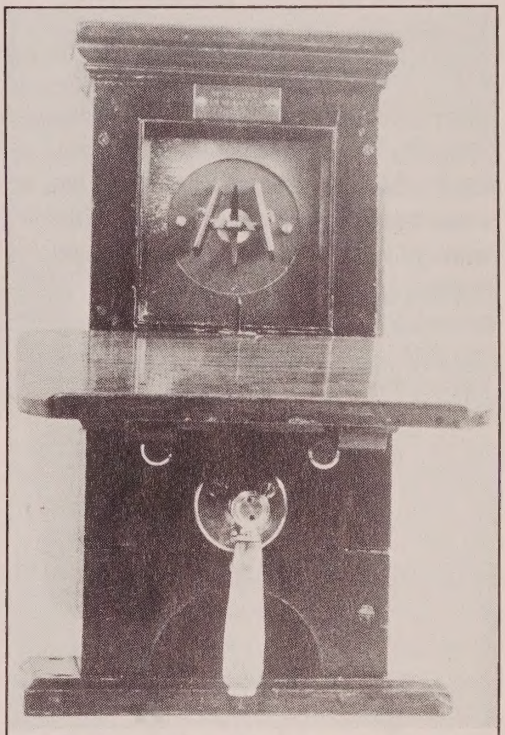
(See *OTB* Vol. 31 No.4, Feb. 1991)

Q: How many kinds of needle instruments were there? How were they used? How do the codes compare with ours?

A: Much as with radio sets or automobiles, this type of telegraph set had many variants as it evolved over the years. For instance, Cooke devised a five-needle instrument. Then it was simplified into the single-needle type, then into the two-needle instrument for better efficiency in operation.

Each type had a handle, or knob, mounted on the lower part of the case, as the transmitting part. Some of these instruments may be seen in the Smithsonian, and many types are exhibited in the Science Museum in London.

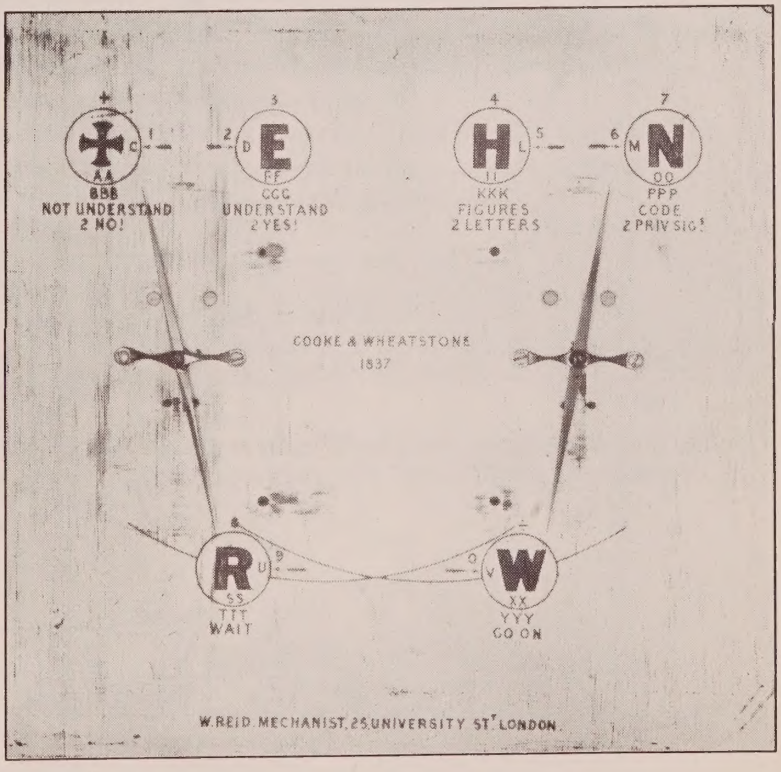
They were operated by turning the handle (or knob) that controlled the indicating needle at the distant end. It swung to the left or right on the dial plate. Also, each instrument in the office had a blank dial plate. Only the learners' instruments had the deflections of the code marked on the plate, and there were different codes for each so that the operators had to adapt to the specific instruments in the office. Strangely enough, there were indicators for the numerals. Each of the large letters at the top of the dial plate represented three numbers; thus the first letter might represent one, two, or three deflections of the indicating needle.



Single-needle instrument: sending handle at bottom, receiving needle at top. Nameplate at top reads "Reid Bros. . . . London."
Photos: Science Museum, London

As each letter in a message was sent, it was necessary for the operator at the receiving end of the wire to acknowledge it before continuing with the next word.

Now, each of these dial plates was equipped with two short ivory pegs on either side of the needle to dampen the swing of the indicating needle, or in case of the double needle each one had its own dampers. The unique aspect of these instruments is that the "needle clerks" learned to read by sound because each damping peg had a different tone so that the operator who was receiving did

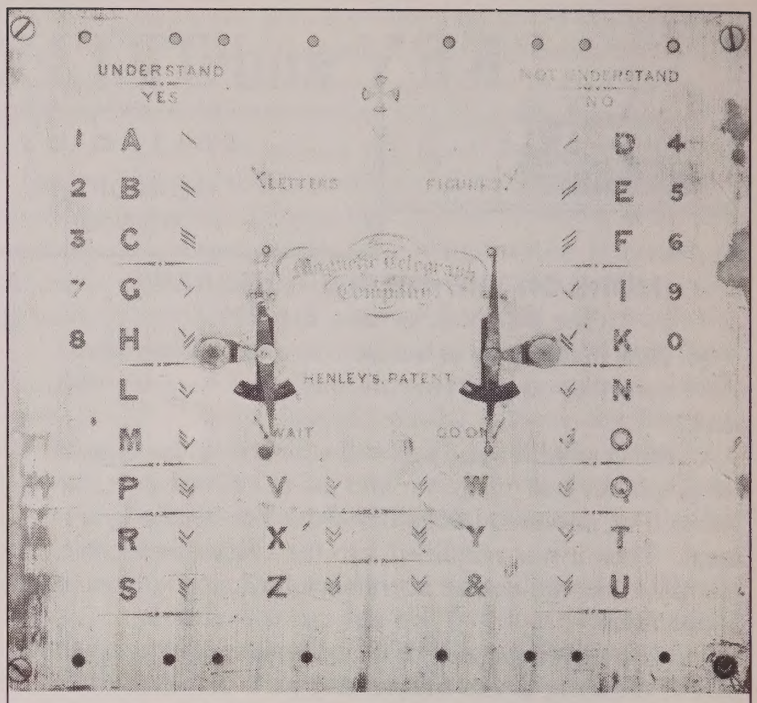


Right: Faceplate of Cooke and Wheatstone two-needle telegraph set, used on British railways from 1840 onward.

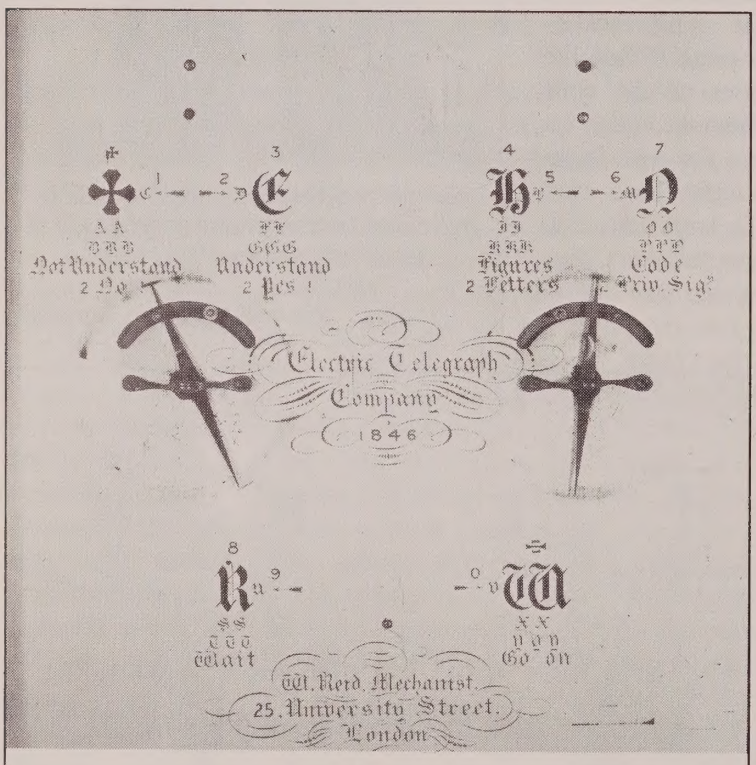
not need to read the deflections of the needle but could recognize the left or right movements from the sound of the tap of the damping peg.

The system really isn't very hard. There are a number of published works describing the method of operation, for example, "The Origin and Development of the Electric Telegraph" from the *Journal of the I. E. E.*, March 1956, as reprinted by the Arno Press in 1977 in The Electric Telegraph - An Historical Anthology. The single-needle system lasted into this century in Britain; the textbook Telegraphy (T. E. Herbert, London: Whittaker & Co., 1907) describes two types of single-needle instruments in detail.

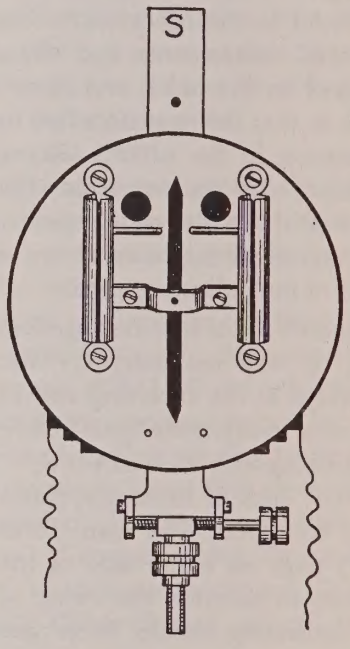
As for code comparison, well, the original Morse is faster since there is no need to acknowledge each letter, but then who knows?



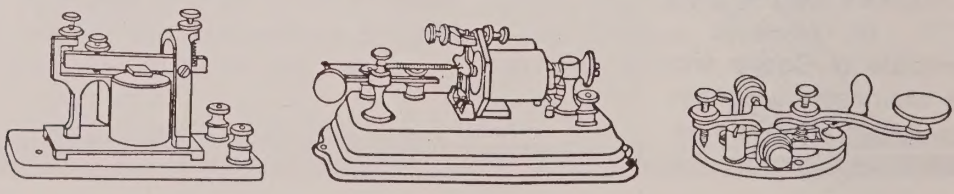
Faceplate of the Henley-Fortin telegraph of 1848, showing the differences in code from the earlier set. A close-up of the set shown in the Feb. 1991 *OTB* article.



Cooke and Wheatstone instrument "used in the Houses of Parliament around 1850" (for press reporting?).



"Neale's coils" - a "modern" needle dial, from the Herbert book (1907). The split tubes on the face are acoustical resonators for improved volume.



MEET THE COLLECTORS

Rodney Schrock, KD3OR
402 Lincoln St., Somerset, PA 15501

THE GE "TC" CHASSIS

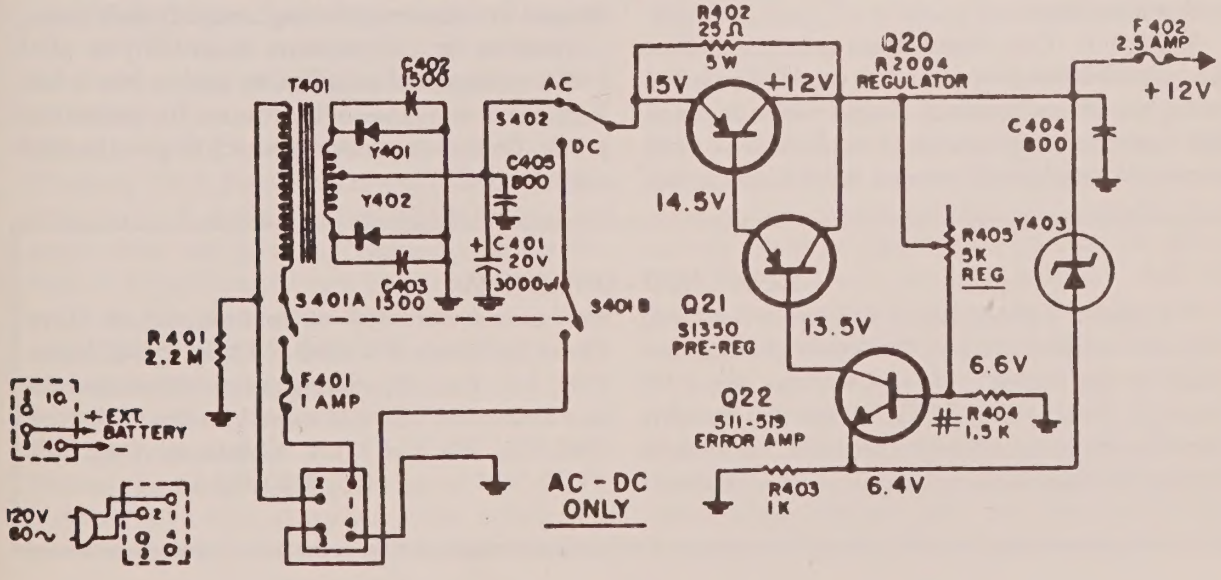
In 1967 or 1968, GE introduced its first line of all-solid-state black-and-white TV sets. In 1968-73, when I did part-time servicing for a local GE dealer, we always returned these sets to Pittsburgh for repairs. Most of them still being under warranty, and solid-state TV being something new and mysterious, distributor servicing was an easy way out.

Some of these sets were very troublesome and people sometimes traded them in on the more reliable tube-type sets. While cleaning shelves, the store owner gave me one of these TVs which someone had attempted to repair, resulting in a basket case. I brought it home and put the pieces together in an attempt to see what ailed it.

I fired it up, took some scope traces and found there was no vertical deflection. Taking voltage readings in the vertical area indicated the output transistor was shorted. After replacing Q19 with an old audio-output transistor from the junkbox, the +12-V bus rose, a raster appeared and I had a picture. But the "12-V" bus was 11 V. The AC input current was approximately 1 A and the raster was torn apart with 60 Hz. Thinking I had a short in one of the deflection circuits, I started checking currents, but found nothing out of line. After all, the current on the DC side didn't seem too bad - 1.5 A.

So, when all else fails, look at the power supply. I'm a slow learner; experience should urge a person to examine it first. Removing fuse F402, I substituted an ammeter, a voltmeter and a dummy load made out of old sand-coated filament resistors. By shorting resistors in the load and monitoring the output with a scope, I was able to increase the current. When the output current increased to approximately 1.5 A, the power-supply output went from smooth to high 60-Hz ripple! Scoping through the supply, I found classic *half*-wave ripple. There was no AC on one of the diodes, but OK out of the transformer - a broken foil on the circuit board. Repairing the break restored full performance. That was the end of trouble except that later C266, the condenser between the horizontal output transistor and the yoke, shorted and all the pots on a ceramic card in the vertical circuit went hopelessly intermittent. I replaced them with three small heavy-duty units.

In retrospect, I guess it would have been simpler to try the set on a car battery, instead of looking for trouble that wasn't there!



HOW TO MAKE YOUR NEW GRILLE CLOTH LOOK OLD AGAIN

John Okolowicz
624 Cedar Hill Rd., Ambler, PA 19002

Have you been disappointed lately with the appearance of your set after installing a new reproduction grille cloth? While it may look good, it probably looks *too* good. I have been trying to repro this stuff for the last year or so and can truly say the "they don't make 'em like they used to." The factories today will not weave the cloth in the way that they did in the '30s. Even if they did, you would have the same problem of how to give 50 years' worth of "character" (i. e., smoke-filled rooms, dust, acid rain, etc.) to the finished product. For those who prefer to strip and polyurethane their radios, these tips may not mean much, but for those who strive to keep every bit of authenticity in their radios, I would like to suggest some "home remedies."

I realize that the cloth averages about $6 a piece and that experimenting can get a bit expensive, so I catalogued by experience so that you can do it "right the first time" with minimum waste. Always use small samples to try out one of these methods. In that way you are sure not to ruin a good piece if you do not care for the results.

Method 1. Use a strong solution of black coffee. Either instant or fresh-brewed will do, although I have experimented only with fresh. It may appear that you are going to ruin a good grille cloth; I assure you that that will not happen. The rayon-polyester will not take too readily to dyes or stains and once your cloth has dried out it will look much improved over the original. The shine will have been reduced and it will have a slight brown dullness to it.

Method 2. This is the same as number one except that you add strong fresh-brewed tea to the coffee. The tannic acid in the tea helps the stain work a little better.

Method 3. Use a very dilute solution of shoe dye. I use Fieblings because it is soluble in alcohol (other brands use benzine). I start with a bottle of light brown costing around $3, and dilute a small amount (somewhere between a thimble and a shot glass) to a ratio of one dye to three or more alcohol. You may want to start out very weak and work backward to be sure not to ruin your cloth. The shoe dye is very potent and will permanently dye anything it touches, including your hands, so be sure to use gloves. At a ratio of about 1:6 it approaches the mildness of the coffee/tea method. Again, do not be fooled by the darkness of the cloth in the solution. Even soaked in water, the cloth will turn dark, so you must wait until it dries to see the result.

Method 4. This method results in a fair job, but I'm not sure if the irritation is worth it. By using common household clothing dyes (such as "Rit" brand tan #16) you can get similar results. The powder must be mixed with water and boiled in a pan. Always start out with a much weaker solution than you think you will need. Unlike the coffee/tea method, you cannot drink this stuff as you work, as it is toxic. Of course, you cannot drink shoe dye either, but that should be obvious. Because these dyes must be boiled, it takes longer to find the right dye mixture to get the desired effecte.

Method 5. Leave the cloth outside on your clothesline for a year or so to let nature and acid rain run its course. Not very practical, I agree, but I have some out there just to see the effect. I'll let you know if the wait was worth it.

For all the methods above, you can fully immerse the cloth in a tray or pan; but for Method #3 the best approach is to use the applicator that comes with the shoe dye. By doing it this way you will not have to make any more mixture than you need. After your cloth is soaked, be sure to hang it up to dry. If you leave it flat, the liquid will tend to puddle and dry unevenly, leaving unsightly dark lines.

Another tip: if you want to install your cloth with a minimum of wrinkles, be sure to iron it first. You can use a household iron set for permanent press. Be sure to use spray starch to give the cloth some "body."

NEW CLUB - OKLAHOMA

Oklahoma Vintage Radio Collectors is looking for new members to join the fastest growing new club in the region. At two months, we're 40 strong! Yearly dues of $12 brings you monthly newsletters, meetings and events with our diverse group of enthusiastic collectors. The club meets the second Saturday of each month at Gary Dales Barbecue, NW 63rd and May in Oklahoma City, at 6 PM. Upcoming dates: November 14 and December 12. For more info send SASE to OKVRC, PO Box 1197, Oklahoma City, OK 73172-1197 or call (405) 722-0595.

THE CHEMISTRY OF COILS

D. K. Owens
478 Sycamore Dr., Circleville, OH 43113

We commonly say that an open transformer or coil is "burned out." With the exception of power transformers, this is usually not the case. It certainly cannot explain why the secondary of an AF transformer which carries no current often is open. In my experience, most audio transformers and small coils fail by corrosion of the copper wire - not by excessive current melting the wire. To understand how corrosion happens and how it affects the prospects of repairing the coil, it is necessary to know a bit about the chemistry of copper.

Copper is below hydrogen in the electromotive series. That means that copper is not ordinarily attacked, even by strong acids, unless oxygen is present. So how does acid get into a coil? In the 1920s and 1930s it was common practice to impregnate or pot coils with wax, tar, shellac, or all three; in the belief that moisture must be excluded. Given the lack of good insulating papers and wire varnish, this belief probably had a reasonable basis in fact.

AUDIO AMPLIFYING TRANSFORMER

All the potting materials mentioned above were natural products because good synthetic substances had not yet been invented. All natural waxes, tars, and shellac contain traces of free acid. Refining methods were not very good, so acid-free potting materials were not available. Some materials contained less acid than others, but the choice was a matter of luck because the effect of acid on the coil wire was not appreciated at the time. For example, it is common to find open transformers in all Atwater Kent sets and shorted filter capacitors in AK sets of 1927-29. In contrast, I have never seen either defect in an RCA set of the same time period. Evidently RCA made a lucky choice and AK a poor one. I doubt that set designers worried much about coil corrosion because a design lifetime of 10 years would have been adequate. Who could imagine that people would be playing these sets 65 years later? It takes about 40-50 years for serious corrosion to develop. Even so, AK must have been aware of a problem because they made the capacitor bank in the Model 44 replaceable instead of potting it in tar.

As we have seen, acid alone is not sufficient to corrode copper. Oxygen (air) is also required. This means that the break in the coil will most likely not occur deep within the coil where air cannot penetrate, but at the surface where the wire emerges from the wax coating. This is good for us because there is an excellent chance of finding and repairing the break.

Whether to attempt repair depends on the transformer or coil. With AK sets, I have not found it worthwhile to attempt repairing audio transformers because they are potted in tar, which is very difficult to remove to get at the leads. Small, modern units can be installed inside the cans without affecting the appearance of the set. In sets where the transformer is visible and has a unique appearance, a modern replacement is not appropriate and repair should be tried. Repair of RF and IF coils is also appropriate when the coil is of special design or no replacement can be found to fit the original can.

I have been successful about 70% of the time in finding and repairing coil breaks. I remove the coil or transformer from the set, take it apart, and use a strong magnifying glass to inspect the fine coil wire where it emerges from the core and attaches to the lugs or lead wires. It may be necessary to peel back some of the insulating paper or to melt away the wax with a warm spatula to see the wire. Look for a green discoloration in the wax which signifies corrosion. Carefully tease out the wire with a needle, and the break usually becomes apparent. Repair is made by bridging the break with a piece of fine wire soldered in place.

Be sure to check the coil with an ohmmeter before reassembling the unit; there may be more than one break. I once repaired a speaker field coil which had five breaks. Fortunately, they were all at one end where the wire was accessible, and enough could be pulled out of the coil to splice. This coil was not wax-impregnated. All five breaks were caused by corrosion from the acid in a paper insulating washer at that end. The other end used a different kind of insulating washer and was not corroded. Finding and repairing a coil break can be tedious and time consuming, but not nearly as much so as rewinding. Don't be timid about trying this approach. An open coil is useless anyway, so what have you got to lose?

"I CROWN THEE KING OF THE NOVELTY COLLECTABLES"

Bob Haworth, W2PUA
112 Tilford Rd., Somerdale, NJ 08083

This title might seem a little bizarre to some readers, but bear with me and I'll explain. About 15 years ago I was introduced to Clay Seidel, one of the many radio collectors of South Jersey. Clay has collected and restored about every radio type known to man. While being shown the various radios that he has collected (with attendant AWA ribbons) over his 30-odd years of restoration, I spotted one that intrigued me for its simplicity and novelty. The set was a "keg" radio: a receiver built into a miniature whiskey cask. Clay stated that this was perhaps one of his rarest finds. Aside from his, he had seen only one other set of this type - in an antique shop, and the owner wouldn't sell it. Since then I have seen only one other - a ceramic design owned by a local friend, Frank Krantz.

Clay's set intrigued me, with its brass bands, oak staves and spigot on one end, while radio tuning was on the other. I determined to look diligently for a similar unit. At that time I was sufficiently naïve about radio collecting as to believe the unit would come my way in a year or two.

My reasoning for this rash statement? I'm a flea-market freak - attending a commercial auction once a month on average, and visiting the local flea market every week, rain or shine. Its gotten so bad that my wife is now convinced that it gives the "fix" I need to survive the week.

In view of the strange things that show up at the mart, I was convinced that one to two years would produce the radio. (I am of the firm opinion that "given enough time, everything that man has ever made will someday surface at the flea market."

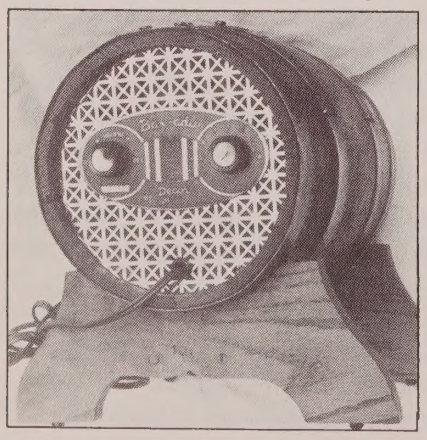
It was not to be so - two years stretched into four, and four to six and on until a full decade and a half had slipped away. But the desire still burned in my memory.

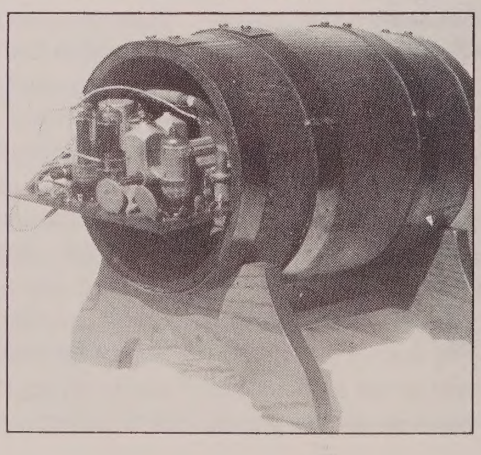
Then one bright crisp winter day my patience was rewarded. While touring the aisles I happened upon a vendor, freshly arrived and just completing his setup. There on his table was my quest - a keg radio.

I seized the moment, paid the asking price, and carried off my long-sought prize - like a knight of old accepting the scarf of the tournament's lady.

The radio appears to be of English manufacture, with a serial number of just over 1000. A plate at the spigot end says "Decor Ltd." No model number or label identification is present - only the metal plate on the tuning end providing the name "Bar-adio by Decor," which I thought was almost as unique at the radio itself. I found a mixture of English- and American-type tubes in the set. Judging by the printed-circuit assembly, I placed its manufacture as the middle to late '60s - just before the transistor boom. The speaker faces downward in the keg, with four wide slots to provide the sound exit. There is a quick-disconnect between the speaker and the set: figure-7-shaped clips that snap together. A semi-rigid piece of spaghetti slips over the connector to hold the joint together and insulate it.

The photos show the details of the keg set. The five-tube radio with ferrite antenna provides excellent local reception, while the 3/4" oak staving enhances tonal qualities.

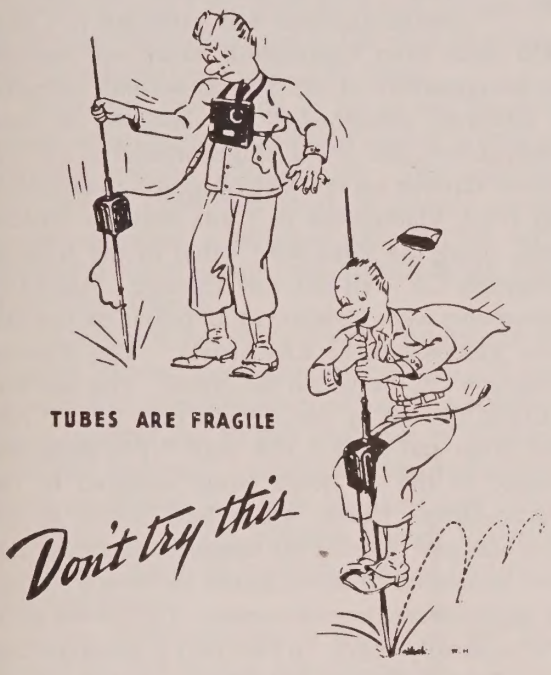




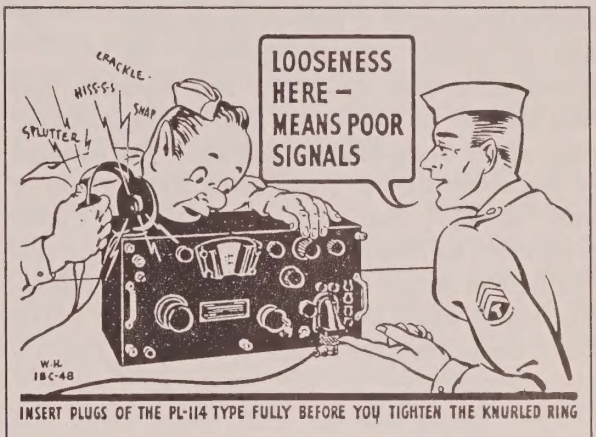
The radio now adorns our étagère but appears a little lonesome. So I'm starting a search for a queen for my king. Who knows, maybe if I'm lucky they will find a way of reproducing and my quest will be over. But that's strictly something for the future.

TECH-MANUAL ART

Military technical manuals of the pre-war period and early in WW II occasionally contained small cartoons to emphasize a point or fill an idle bit of page space. In particular, Signal Corps manuals from Ft. Monmouth carried the work of one "W. H." However, as the military publication system grew and matured, whimsy disappeared ("The colonel says no more drawings . . .") Here are a few examples of line art that perhaps relieved the monotony of military/naval training.

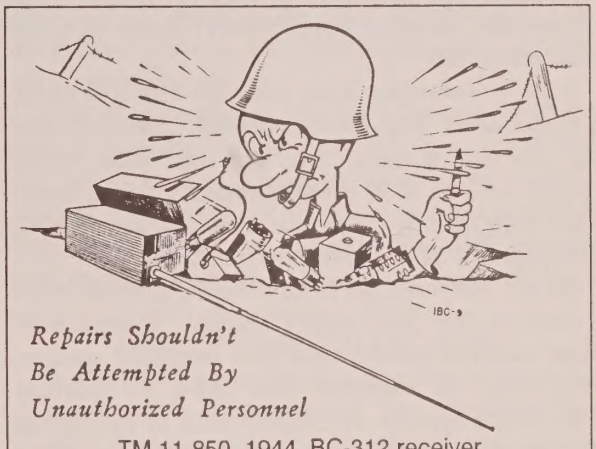


TM 11-245, 1943, SCR-511/BC-745 transceiver

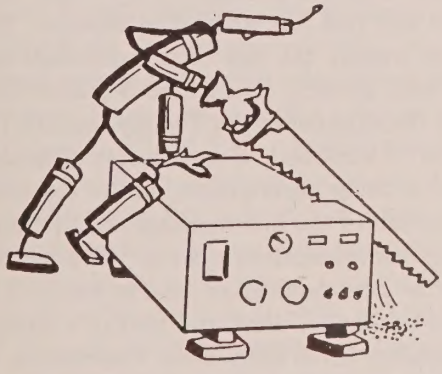


TM 11-850, 1944, BC-312 receiver

AN 08-40SCR522-3, 1944, SCR-522 transceiver



TM 11-850, 1944, BC-312 receiver



Philco Tech Rep manual, 1946, AN/ART-13A TX

AN 08-10-195, 1944, AN/ARC-5 system

THE U. S. SIGNAL CORPS IN SIBERIA

From the Report of the Chief Signal Officer, 1919

One of the more obscure aspects of American participation in WW I - one they don't tell you about in high school - is that toward the end of the war (August 1918), several thousand U. S. infantry troops were sent to occupy Russian territory. In collaboration with the British and Japanese, they held the port of Vladivostok and several thousand miles of the Trans-Siberian Railway. The purposes of this action were to guard some 800,000 tons of war supplies that the now-defunct Czarist government had bought on credit from the West, and that were in danger of expropriation by the Bolsheviks; and to allow the evacuation of about 40,000 Czech troops from the interior of Russia. (This is a gross simplification; for full details, see George F. Kennan, Russia and the West Under Lenin and Stalin, Mentor Books, 1960.) In the political confusion following the Soviet Revolution, with civil war raging here and there through the future Soviet Union, the American troops weren't finally removed until early 1920.

I got to wondering some time ago how this small, isolated army had communicated, internally and with the outside world. Had they used radio, for example, with SCR-50 truck-mounted spark stations? Had they tried to cover the huge distance with a chain of, say, SCR-79 low-power tube radios?

Not so: this turns out to have been a landline effort - radio in 1918 form wasn't suitable. Communications involved mainly local field telephone systems, and open-wire telegraph lines along the railroad. The history appears in Chapter XXX of the official Report of the Chief Signal Officer, 1919 (Arno Press reprint, available through Antique Radio Classified.) Here's how it went: [Ed.]

On September 9, 1918, Company D, Fifty-third Telegraph Battalion, Signal Corps, consisting of one first lieutenant, one master signal electrician, four sergeants first class, three sergeants, six corporals, two cooks, 18 privates first class, and 17 privates left Manilla, P. I., on the U. S. Army transport *Crook*, bound for Vladivostok, Siberia, and arrived at that place September 18, 1918. Immediately upon arrival the company, together with the detachment which had preceded it, began taking over the work of providing communications for the American Expeditionary Forces in Siberia. The communications to be provided consisted of two kinds, the local telephone installation at the port and the operation of the telegraph line which extended along the Trans-Siberian Railway, connecting the various points at which American troops were stationed. The first line of telegraph communication stretched from Vladivostok to Khabarovsk, a distance of 480 miles, with relay and intermediate stations at Nikolsk, Spasskoe, and Bocharova. Shortly afterwards the line of communications was extended to Chita, 1,850 miles from Vladivostok, which had become the headquarters of the Twenty-seventh Infantry. A 100-drop switchboard was installed at base headquarters, and in the neighborhood of 100 telephone stations set up. The telegraph communication from Vladivostok to Chita was via Khabarovsk, using the same wire - that of the Russian Telegraph Co. - all the way through. American instruments were installed at all points on the line from Vladivostok to Khabarovsk. The Russian Telegraph Co. furnished the power. The line was available for use by the Signal Corps from 7 AM until noon and from 5 PM until 7 PM daily, the balance of the 24 hours being assigned to the Czecho-Slovak forces, which had offices in the same stations. During the winter communications were hampered to some extent by severe storms, but repairs were promptly made. Traffic was at no time especially heavy. In February a telegraph line was constructed from Vladivostok to the United States wireless station on Russian Island, so that the press reports received by that station might be distributed throughout the entire American Expeditionary Forces.

In Chita, the telegraph office was maintained in connection with the local civil operators and the Japanese military authorities. Messages at Chita were handled by the American Signal Corps for all the allied forces located at or passing through Chita. The use of the wire was granted twice daily, at 8 AM and at 4 PM, for a total average of about three hours a day. Every assistance was extended by the Russian telegraph operators at that place.

In March, First Lieut. Kirk, who had been acting as signal officer, was relieved by Capt. Charles Barrett, who had just arrived in Siberia. During the same month, the line of communications was pushed still farther, to include Verkhne-Udinsk, where a detachment of the Twenty-seventh Infantry was to be stationed. Considerable difficulty was and still is being experienced, due to the shortage of personnel for the maintenance and operation of the long communication system. The last extension of the communication system was to a point between Verkhne-Udinsk and Baikal, a distance of approximately 2,900 miles from Vladivostok, which now forms the farthest outpost of the Signal Service in Siberia.

THE MAILBAG

Readers' comments on early radio topics are welcome. Because of space limitations, letters that are published may have to be edited. Send all material to the Editor.

BRAND-SPECIFIC CLUBS

The August 1992 *OTB* has come out tops once again and a pleasure to read. Full marks, especially for the coloured cover picture!

I note on page 7 the good news that an historical society has been dedicated to the work of a fellow New Zealander (or Kiwi), E. H. Scott.

Mention is made that as far as can be determined, no other radio historical society is oriented toward a specific manufacturer. The organisers may like to know that there is already another one-make society, established early in 1990, with a worldwide membership - the British-based Eddystone Users Group.

As you are no doubt aware, Eddystone was founded 70 years ago to make precision SW components and communication receivers, and were in many respects the British analogue of Hammarlund and National - producing top professional-grade equipment, available to hams and DXers. Unlike the great U. S. builders, though, Eddystone is still very much in business, now as part of the Marconi group.

If any AWA member is interested, the EUG contact is: Ted Moore, Moore Cottage, 112 Edgeside Ln., Waterfoot, Rosendale, Lancs. BB4 9TR, England. I understand that there are also one-make societies for HRO, Collins and Racal, but I have no details. **Peter Lankshear**

A 6D6 MYSTERY

I have a question for the readers of the *OTB*. I bought a radio chassis which uses a 6D6 as the IF stage. The tube in that socket doesn't work normally. It is stamped "International" on the base, but the label on the glass is unreadable except maybe a "6." Examining the element structure shows that it matches a real 6D6 (shield, grid wire structures, etc.) except possibly the heater wires. Tests on a tube tester showed no emission at 6 V and no heater glow. Increasing the heater voltage revealed a normal cathode color at about 12 V, 0.5 A, at which the tube checks out OK. No shorts, etc. Does anyone know what tube this could be? I am curious. I know only similar tubes to be: 57, 58 (2.5V); 6C6, 6D6 (6.3 V). **David Dameron**

[Here are some thoughts on the mystery 6D6 . . . First, it pretty much has to be a 6D6 - there were no 12-volt six-pin tubes, and you have successfully listed the possible similar tubes above - except for something unusual like the (6-volt) 1603. A 6C6 or 1603 would probably substitute anyhow. The "International" marking, particularly if engraved, suggests an origin in an International Kadette radio, although there were white-inked "International" replacements available in recent times.

The way to detect the missing characters is to rub the tube across the back of your head to get a bit of oiliness, then to gently stroke the oil coat with a finger to get a microscopically thin layer. Holding the tube up to the light and rotating v-e-r-y slowly will then reveal the missing characters.

Occasionally the cathode connection, the "tab," will break. At 6 V, no emission. At higher voltage, 9 or 12 V, the cathode expands enough for the tab to make contact. As the tube heats, the tester shows ["wham!"] normal emission. Going back to 6 V, the emission suddenly cuts off. I found four or five such cases in testing a lot of about 1500 used tubes.

Judging the cathode color is an inaccurate process: it usually works fine. But there are tubes with the cathode sleeve protruding beyond the heater wires, or pinched down at the end, with a poor view of the glow. Or the inside of the glass is fogged slightly by the flashed getter or a bit of Aquadag graphite coating in the wrong place.

A lot of low-emission Thirties tubes respond magically to heat-treating the cathode: run 'em at 9 V (no more) for 2 to 3 minutes, or until the emission reading stops rising. This bakes out contaminants from the oxide on the cathode. It's rarely effective with postwar tubes, but I fixed up a couple of dozen early, weak 6F6s this summer. Ed.]

McELROY'S SPEED RECORDS

In the three years (so far) that I've been doing research for a biography of Ted McElroy, I've learned that one relies on his ads, articles, and interviews at one's peril. McElroy was justifiably proud of his acomplishments, but had little concern for the details of the what, when, and where of their occurrence.

So while Lou Moreau correctly relates the data from his 1936 ARRL Handbook ad ("Key and Telegraph," August 1992 *OTB*), it is mostly wrong. McElroy's first three records, all set in 1922, were: Boston, 51.5 WPM; New York, 56.5 WPM; Chicago, 56 WPM. The 1935 Brockton record of 69 WPM is correct. My references for these are the engravings on the trophies, all of which (to answer the question in the column) are in the possession of Ted's widow and son.

Another oft-misquoted record is McElroy's 1939 Asheville speed, which was 75.2 WPM (still the unbeaten record in official competition). Other writer have followed Ted's lead in confusing that speed with his 1935 Cape Cod demonstration run of 77 WPM. **Tom French, W1IMQ**

IN-HOUSE

Bruce Kelley

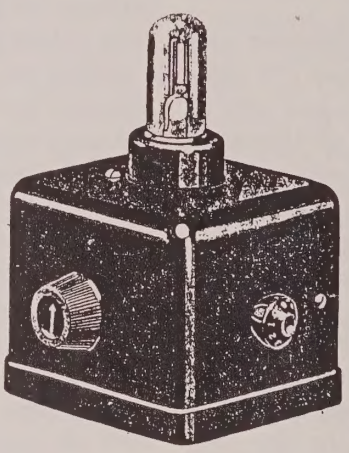
OT CONTEST: The first AWA OT Amateur Contest was announced in the December, 1970, *OTB* with operation scheduled for Feb. 3 and 10, 1971. There were 12 participants, with winner Bob Morris, W2LV, using a 47-46-210 transmitter. Scoring was simple, with only one multiplier. Much credit for the success of this annual event goes to Ken Gardner, W2BGN, who reported the scores for over 20 years as participation grew about 8-to-1. The 1993 event is scheduled for late February. Details will be in the Feb. *OTB*.

RESTORATION OF FORT: Visitors traveling near the junction of I-15 and I-90 in central Utah may find an outpost built in 1867. Known as Fort Cove, it was recently restored by the Mormon Church and houses an ancient single-wire telegraph station. Our interest? AWA assisted the project's curator Don Ender in acquiring equipment, including an early telegraph relay plus a tape cassette actuating a sounder receiving genuine landline (American) Morse.

CROSLEY PUP: Twenty years ago I featured the Crosley Pup one-tube regenerative receiver in the *OTB* (Mar. 1972). There was a reason - it was my first factory-made set. As a young boy, having graduated from a crystal set, it was the answer for broadcast DX. I remember one annoying feature: it was difficult to log stations with the Crosley "book" tuning condenser. Yes, I goofed in the last *OTB* in citing a current value of $200. The little $9.75 set is now selling for close to $400 with a WD-12 tube! How's that for inflation? It works out to about 5% per year compounded over the past 70 years.

"EMPIRE OF THE AIR" was shown again on PBS stations in August. Many who had seen it earlier reported enjoying it more the second time, as they were in a better position to appreciate the interrelationships among the three radio pioneers. The book and VHS tape are available from John Terrey's *Antique Radio Classified.*

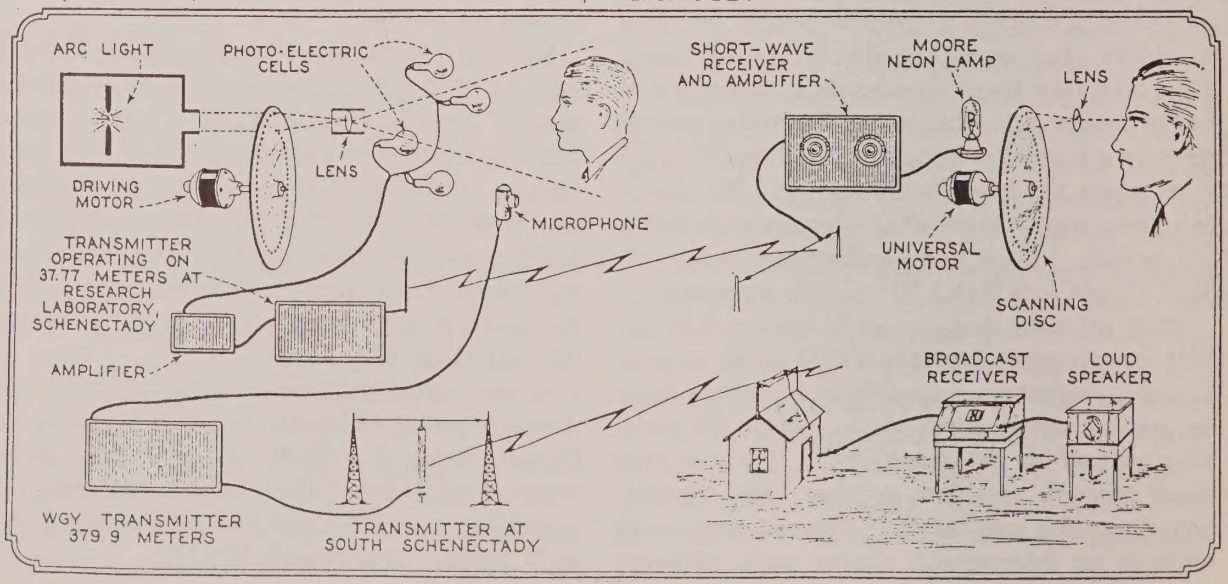
A REMINDER: AWA has reserved two tables at the Radio Club of America's Annual Banquet in NYC in November. When making reservations, ask to be seated at one of these tables.



The "Pup"

WHERE'S THE SOUND? The AWA Museum displays three mechanical-scanning (Nipkow-disc) television sets: a 1927 homemade 24-line disc set, a Baird 1930 60-line drum scanner with tuner, and a rare Jenkins set using lens, mirror and ground glass. After a museum guide describes the operation of the sets to a visitor, he is frequently asked, "Where's the sound?"

Shown is a rough layout of E. F. W. Alexanderson's television setup (GE) at Schenectady. The station was a favorite for experimenters in the late '20s and typical of the time. As shown, the sound (voice) transmission was completely independent of the video and could be heard on a standard broadcast receiver. This operation was the cover story for the May 1989 *OTB*.



NEW MEMBERS

Joyce Peckham

AWA welcomes the following new members. We list all new members routinely - if your name does not appear within six months after joining, please advise the Editor. If you do not wish to be shown, just mark the application form accordingly. AWA does not provide an address list or other directory of its membership.

Paul **Angelino**, CA
Thomas B. **Ballard**, WB3FNQ, MD
Jerry **Balliano**, NY
Bill **Beilstein**, IL
Jon **Bergstrom**, VT
J. B. **Bingeman**, NJ
Forrest K. **Bland**, WD0DQP, KS, radio & TV repair, US Navy
Kenneth **Boardman**, NJ
Jon **Book**, KB0EDE, IA, chief engineer, WOC
Phil E. **Boydston**, LA
Ged **Bryon**, MA
Casimir V. **Brylinski**, WB2YCI, NY, WW II radio operator
Alton Thomas **Butkewich**, WX3U, PA, eng. consultant
Charles L. **Cable**, KS
John R. **Caldwell**, MI, Univ. of MI, Space Physics Res. Lab.
Vane M. **Caley**, OR
Wade **Calvert**, WA9EZY, IL
Erik **Carlson**, TX
John **Carmody**, N8FFG, OH
Ira **Carroll**, IL
J. Keith **Carter**, VE3RFH, ON, Pratt & Whitney Canada, founding member - Amateur Radio Fessenden Society
Michael F. **Cascanet**, NY
Harold J. **Clark**, NY, electronics tech.
Thomas R. **Collins**, MA
Robert L. **Conley**, MA
Barb **Cooley**, WI
Jim **Cronin**, NY
Richard C. **Crossley**, KE4PH, FL, Electro Corp.
Arthur **Courtney**, Australia, Resurrection Radio (restorers)
Frank **Cox**, AZ
LeRoy H. **Curry**, FL, RCA, Zenith
Zoltan G. **D'Albert**, IN
Donald T. **Dalena**, PA
Virginia K. **Damiao**, CA
James A. **Davis**, TX
Richard J. **Davis**, OH
Charles J. **De Taeye**, IL
Maurizio **Della Bianca**, Italy
Frank S. **Dewey**, NJ
John J. **Donelon**, NY, worked in W2XJT-TV 1949, owned TV repair store in NYC 1950-
Steve **Dragosz**, WI
Henry J. **Edmunds**, KB4PLY, FL, NY Tel.
Edward J. **Egan**, PA
Roger **Ela**, W1MKO, MA
Carter **Elliott**, WD4AYS, VA
L. Clay **Elrod**, SC
Robert W. **Enos**, TX
Matthew **Erdahl**, AZ
John **Erlagen**, NY
Bob **Ferrey**, Jr., N3DOK, PA, electronic ass'y & sales
John **Flanigan**, ex-W3EEH, PA
Frank L. **Fusco**, NY
Daniel J. **Gauthier**, W2FUP, NJ, Raytheon
Richard **Gerdes**, AZ, Singularity Corp., WJOL, KLEE
Paul **Gericke**, WD5IGF, LA, founder, WBSN-FM
Sidney I. **Gettenberg**, NY
George J. **Gianakaris**, VA
Gary **Giedd**, MD
Don **Gilman**, FL
Kris L. **Gimmy**, SC
Thomas H. **Gleeson**, Jr., FL, USAF airborne radio oper.
Tom **Gould**, MS
Roland M. **Gowin**, AZ
Albert V. **Grochowski**, NY, ITT & WU World Comm.
Bill **Hahne**, IN
Jeffrey D. **Harman**, OH, WNUF
Jeremy **Harris**, AL
Ernest **Hartman**, NJ, radar repair, 1950s
William R. **Haugh**, Jr., FL
Ernest **Haus**, NY
Chuck **Helmer**, Jr., TX, KAVE-TV & AM, Helmer Radio & Appliance
Gary P. **Hoffman**, AA2IZ, NY
Ruthie **Hoffman**, AA2IO, NY
Carrol Lee **Hoover**, CO
Arthur L. **Horton**, CA
Larry J. **Horvath**, MI
Samuel **Horwitz**, W3HOR, PA, electronic publishing
Tadaomi **Hoshino**, JA1VNY, Japan
Joseph J. **Hurley**, CT
Larry **Inks**, CA
International Components Corp., NY
Mark **Irwin**, ON
James R. **Jaman**, PPA
Delton L. **Johnson**, CA
Mark Joseph **Johnson**, CT
Jeffrey **Kaladas**, NJ
Tony **Kennard**, QU
Johnny C. **Kennedy**, TX
John **Kessel**, W4IC, NC
Bill **King**, VA
Larry R. **Kinney**, CA
George **Kitazawa**, PA
John **Kleinfelder**, NJ
Thomas H. **Lamoreaux**, Lamoreaux Drugs, MI
Ronald M. **Lathrop**, CA
Thomas W. **Lee**, TX, Motorola
Michel **Lefranc**, QU
Jack **Leggett**, VE3DT, ON
Jeffrey B. **Lendoro**, IN
Frank N. **Leicht**, NJ
Les **Leigh**, KH6DRK/6, CA, RCA Global Comm.
Ed **Lembcke**, K0IPA, VA, Signal Corps - HF radio, satellites
Chip **Lim**, CA
Marvin E. **Lunar**, TX, wholesale radio & TV supplies
David **MacBrien**, NY
Joseph M. **Marra**, FL
Donald S. **Maurer** PA
Lester **McClellan**, TX, radio-TV shop owner
William E. **McCollum**, AZ
D. H. **McDonald**, New Zealand
Howard A. **McGee**, ex-W9CHU, CA, xmtr eng. at WREN & WOWO, RCA, GE
Robert A. **McKanna**, NY
John **McKinsey**, CA
N. F. **McNally**, RI
William P. **Merry**, CA
Donald D. **Metzger**, NH
Henry **Miller**, TX
Charles C. **Milton**, GA
Eric **Moon**, NY, prog. dir., WLKA-FM
Peter James **Morris**, FL
Robert C. **Mount**, KB6MHS, CA, USAF avionics

Kevin **Murphy**, MO
Angelo **Napoli**, NJ
Calvin L. **Nichols**, WB2OFW, NY, Flightline Electronics
Dean E. **Nold**, NC, Ten-Tec
Kazunari **Oshima**, Japan
Ed **Oxer**, W8KCI, MI
Pasquale **Padula**, NY, USN
Thomas E. **Palmer**, Sr., WI
Frank **Parisi**, MA, in radio since 1941
J. D. **Penniston**, WI
Forest E. **Perkins**, ME, DJ-newscaster
Harold A. **Perris**, NY
Robert W. **Perry**, NY
Clifton W. **Perry**, CT
Drury **Phebus**, MT
Lawrence J. **Pidel**, NJ, USN elec. tech.; NY Tel. Co., WECo
Donald E. **Pitts**, MO, self-employed TV & radio, NRI grad.
Leo **Polaski**, NY, US Army, radio repair and operation
Herbert **Queller**, CA
Greg **Rachwalski**, KA2VAY, NY
Mike **Raide**, KA2RLK, NY
Robert J. **Raide**, W2ZM, NY, WOZO, WCDO, WKLL
Peter W. **Rapelje**, N2PYV, NY, Grumman Aircraft
Emory W. **Readen**, Jr., CA, USN
Atila **Rendy**, ON
Milton C. **Rhodes**, FL
Robert S. **Ross**, VE3JFC, ON
Calvin C. **Ruggs**, WA8KMK, OH
L. Edwin **Rybak**, W3QAG, VT
Jack **Saltamachia**, LA, EE, USAF
Robert A. **Sauers**, NY
Gary W. **Schieffer**, NY
Kevin **Schmalz**, NY
Larry **Schmitt**, FL
Ron **Sconyers**, MA
Richard A. **Scott**, NY
Hartley J. **Schutt**, NY
Charles T. **Shaw**, Jr., IL
Albert P. **Sheppard**, W4ZSC, FL, Georgia Tech
H. P. **Sherrill**, W4NID, GA
Howard L. **Sider**, NV
Brian & Karen **Smith**, CA
Eugene **Smith**, NY
Kevin **Smith**, NY, broadcast eng.
Merrill S. **Smith**, W5VIZ, AR
Lester D. **Smith**, ID
Rick **Snyder**, KS
Sterling A. **Sorenson**, AF6D, CA
Alfred **Sparra**, NY, airborne radar
W. W. **Staats**, W8QWW, WV, Signal Corps
Glenn W. **Stark**, KS
Carl H. **Sturner**, NY
Herb & Barbara **Sweet**, NY, K2GBH & WA2KCL
Bob **Taylor**, AZ
Tony **Taylor**, OH
Thomas A. **Thomson**, WI, AT&T
Robert D. **Turner**, AL
Wade H. **Turner**, Jr., W3ERZ, MD
Edwin C. **Tyrrell**, Jr., PA
Eric **van Staveren**, S. Africa
Thornton E. **Vogt**, MO
E. (Gene) L. **Wahl**, CA
June M. **Weller**, SC
Louis J. **White**, NY
Gary **Wilson**, MI
P. A. **Wilson**, K9BOM, IL, Philco distributor
WOC Radio, IO
Leeman E. **Woodward**, KC4JSW, GA
John M. **Workman**, OH
Edward T. **Wragge**, NY
A. David **Wunsch**, MA, EE prof.
A. O. **Young**, TX
Kenneth L. **Young**, W3RUR, PA
George E. **Zagatta**, KA2HPA, NJ, AT&T Long Lines
Kenneth R. **Zaremba**, MS

(Continued from p. 25)

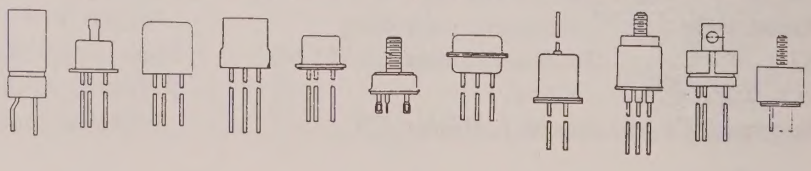
constantly made between chips versus cracks versus dinks, dents, depressions and molding anomalies and the like. Fact is that few sets are found in mint condition and those that are truly perfect should (and frequently do) command extremely high prices. Sets with major defects are usually relegated to the parts pile and those that fall in between are frequently upgraded as a new "parts" set is found. Beware of "Frankensteins," which are radios made from a number of other sets, because they may have no value at all to the knowledgeable collector. It is acceptable to create a "perfect" set from several parts sets if all the radios involved are the same model with the correct chassis. Zenith 500s are extremely susceptible to this practice because so many parts and chasses made over several years are interchangeable. Often a "Frankenstein" has been created innocently by a well intentioned amateur collector. So the reputation of the seller is critical if major dollars are involved. This is far more important with transistor sets than any other, save Catalins, because so many of the little guys were made and frequent changes occurred on-line due to parts availability.

ESSENTIAL READING

One final note to new collectors and a few established ones. Get a copy of Mike Schiffer's book on portable radios. It is both an example of technical-based writing at its finest, and, more importantly, it is a good read full of interesting facts, backgrounds, perspectives and pictures. This book is essential for collectors of small radios. I also recommend you get the Sams' Baby Boomer's series of six books. This for radio identification only, although more pictures of transistor sets are needed. These books are virtually essential for the novice transistor collector who doesn't want to spring for the first twenty or thirty TSMs. For those who are more heavily involved with transistor collecting, the TSM series is a must and you will get them sooner or later.

ONWARD AND UPWARD

Any questions or comments you may have are invited but please use the phone [(201) 585-0030; fax (201) 585-1659] rather than the SASE approach as I'd rather chat than write.



RECENT RADIO AND ENTERTAINER OBITUARIES

Charles Griffen, W1GYR
1225 New Britain Ave., West Hartford, CT 06110

Robert **Fenton**, 66, radio-station owner. He started his career at WINS in NY; owned several stations in California.

Joseph L. **Floyd**, 80, founder of KELO (AM-FM-TV), Sioux Falls, SD. Bought KELO (AM) in 1952 with two partners; formed Midcontinent Broadcasting Co. His holdings grew to 4 AMs, 6 FMs, 4 TVs.

Robert Francis **Hayland**, Jr., 71, Sr. VP, CBS Radio, and GM KMOX-KLOU, St. Louis. He had joined the stations in 1951; pioneered the talk format, endorsing candidates, editorializing, etc.

Dawson **Kahng**, 61, president, NEC Research Insti-tute, Princeton, NJ. Invented key semiconductor devices - first functioning MOS transistor, floating-gate memory cell, etc.

Charles B. **Kaufmann**, Jr., 75, former deputy director of Radio Free Europe. He served with RFE in the U. S. and Germany from 1958 to 1971.

David "Uncle Dave" **Marks**, W2APF, 88. He operated the Fort Orange Radio Distributing Co. in Albany, NY, until retirement in 1972. His first business was Uncle Dave's Radio Shack, opened in Albany in 1920.

Charles G. **Pogan**, 69, Capital Cities executive who helped start WTEN (AM) in Albany, NY.

William Oliver **Reed**, 78, engineer and solid-state physicist. During WW II he was employed in MIT Radiation Laboratory's radar program; then developed TV technology at Zenith Laboratories in Chicago. Held basic patents for TV tuners and CRTs; retired from EG&G Inc. in the early 1970s.

Kenneth Muir **Reichenbach**, 73, engineer at WGNT (TV), Portsmouth, VA since 1976, ending as Director of Engineering. Earlier he worked at WNEW (TV), New York, 1946-76.

Clyde **Rembert**, 91, retired chairman of the Dallas Times-Herald Printing Co.. He joined in 1926; became president of KRLD radio-TV (later KDFW-TV) in 1952.

Bruce **Robertson**, 90, retired senior editor of *Broadcasting*. He joined in 1934 as a correspondent in Chicago; by 1937 headed the magazine's NY editorial operation.

Hugo **Ruchardt**, 64, retired Sr. Director for Technical Planning at Siemens AG's IC Division. He designed semiconductor products - UHF mesa transistors, tuning diodes, etc.

Sergei A. **Schelkunoff**, 95, IEEE Fellow; Russian-born researcher at Bell Labs and one of the developers of coaxial cable. He conducted extensive research on shortwave radio propagation, broadband antennas, and coupling between grounded conductors; published extensively in the *BSTJ* and *IRE Proceedings*; later became EE professor at Columbia University.

Lt. Col. George M. **Simmons**, ret., 80, a member of the Signal Corps cryptographic team that broke Japanese codes in WW II. He retired from the Army in 1979.

Selig **Tanner**, 66, broadcast engineer. He was Senior Supervising Engr., Madison Sq. Garden Network, retiring in 1989. His 41-year career included WTNH (TV), New Haven; NBC; and CBS.

Robert S. **Tyrol**, 68, retired chairman of WTIC (AM-FM), Hartford. He began with the station in 1941 as an announcer for "The United States Coast Guard on Parade" on NBC. At 17, his voice was one of the youngest to be heard coast-to-coast.

Thomas K. **Ware**, W0CF (ex-W6GSX), retired FCC field engineer and spare-time big-band drummer. Active in the amateur-repeater community in Minnesota.

Thanks to Paul Bohlander, W3VVS; Stephen Gerke, N0CRS; Ron McConnell, W2IOL; Ken Greenberg; and Dick Waddell for additional source information.

SILENT KEYS

(AWA members, amateur licensees or not)

George Applegate, W2IA, ex-3VG, 92, early *OTB* author and wireless collector; one-time design engineer on the DEW Line project for WECo.

Glenn S. DeHond

Harold Falk, W8PP

William Halligan, ex-W9AC, 93, founder of Hallicrafters Co. in 1933. AWA charter member and Conference speaker. Started as sales manager for a Boston radio-supply company. Produced budget-priced and high-end SW radios; transmitters; military equipment; even, briefly, TV sets. Retired in 1967 after sale of company to Northrop Corp.

Henry McLaughlin, W8OYV, regular participant in the AWA 20-m net; long-time AWA-QCWA member. *(Thanks to Seth Ward, KC3YE, for info)*

HISTORICAL ARTIFACTS

Old-time ads are free to members collecting and restoring equipment for personal use. **The rules:** (1) one ad per issue per member; (2) include an SASE if acknowledgement is desired; (3) material must be over 25 years old and related to electronic communication; (4) give your full name, address, and ZIP code; (5) repeats require another notice - we aren't set up to repeat automatically; (6) the Association is not responsible for **any** transaction; (7) we retain the right to reduce the size of the ad if over seven lines; (8) AWA does not accept commercial advertising; (9) deadline for ads in the February issue is December 5; those received later will be held for the following issue. Mail **all** ads to: **Richard Ransley, Box 41, Sodus, NY 14551.**

SALE/TRADE

Tubes - early Western Electric and WW I; off-brand 201As. Annual AWA Museum sale. Send SASE for list: Dexter Deeley, 8 Briar Circle, Rochester, NY 14618.

RA-20 power supply, Signal Corps, for BC-312M receiver, replaces dynamotor, exc. cond., needs 5W4 (or 5Y3G), $45. RCA Service Books, 7 vols., hardbound, covering all RCA 1923-51, like-new cond., best offer. John P. Flanigan, RD 2 Box 455-B, Elverson, PA 19520, (215) 286-6327.

Circuit on early BC-348s, first user-friendly, most needed component values on 2 sheets 8-½ X 14, reads left-to-right. Send $2 plus (2) 29-cent stamps. Ray Larson, 1224-½ Gorham Ave., W. Los Angeles, CA 90049.

R-390A $125; SSB adapter for R-390A $35; R-460/UR (HRO built for Coast Guard) $75; Hammarlund Super Pro SP-210, no power supply $50. Want SX-28. Peter Kapp, N7AGR, Box 2208, Fort Bragg, CA 95437, (707) 964-0762.

Addison Model 5 Red and Addison Model 5 Yellow. Nicely marbelized, original, complete, no cracks, original knobs and trim bars. Rogers batteryless Model 220, mint condition. Phone for others. A. R. Nolf, 539 Kastelic Pl., Burlington, Ont., Canada L7N 3S9, (416) 333-4557.

Reflected-power meter, Heathkit HM-15 $10. Skyster model CW-1 horn speaker, S/N 1460, $10. Used 5U4s $2 ea. James S. Looney, WB4RBE, Rt. 1, Box 54, Grundy, VA 24614, (703) 531-8677.

Federal 59 working, VG cond., $900 or B. O.; American Bosch 370, good cond., working, $110 or B. O.; Stewart-Warner 305, working, VG cond., $150 or B. O.; American Bosch Amborola 16, beautiful cond., needs bat. off 1, 2, switch (knobs intact) with orig. inst. book, $300. Harry Kundrat, W2YEZ, 29 Walton Ave., New Providence, NJ 07974, (908) 665-1873.

Zenith Royal 500, $60; Aeriola Sr., $110; Radiola III w/phones, $70; Pilot T601 FM tuner, $40; Edison Amberola 30, $250. Phillip Drexler, 1175 E. Ripley Ave., St. Paul, MN 55109, (612) 771-8630.

TUBES! TUBES! TUBES! "New" old stock and pulls. All checked and guaranteed. Hundreds of types. For complete list and prices, send $1 and SASE to David Meadows, K4LDI, 2920 Shillingford Ct., Marietta, GA 30067.

Collins 51J-4, S/N 2287, min. bid $400; Marconi MSL-5 15-1500 kHz LW 4-tube regenerator, offers; National drum dial; National blank FB7-X coil forms. Jack Rhodes, 2700 Burdick Ave., Victoria, BC, Canada V8R 3I9, (604) 592-3461.

Literature: Radio Masters, flyers, catalogs, brochures, pamphlets, 1935-70. Parts for xmtrs and rcvrs, kW linears. Send needs and SASE to F. Yonker, W2IBH, 1229 Inverary Place, State College, PA 16801, (814) 867-1400.

Victrola cabinet with four doors and record storage, in good cond., $65. Doyle Robert, AC63, Box 236-1, Clinton, AR 72031, (501) 745-6690.

Radios, test equipment, microphones, parts, tubes. Linda & John Gramm, Box 1, Campbell Hall, NY 10916, (914) 427-2602 evenings.

Riders Manuals, Vols. 4 thru 19 (except 9) in good cond., $24 each postpaid. Need bottle for Magic Tone Model 504 bottle radio, or trade Riders for other bottle radios. Robert Hartje, 87 Newton St., Staten Island, NY 10312.

Radio-service test equipment, tubes, new and used parts, service data. Send SASE with your wants. F. Krantz, 100 Osage Ave., Somerdale, NJ 08083, (609) 783-0400.

Radiola 60 feet, repros, $7.50 ea. or $25 for set of 4; many Radiola and GE service manual repros, $10 ea.; Wunderlich $35; 45s $20; 6E5 $4; Radiola 25 instruction card repro (shows Radiola 25 innards, 8 X 10, good for framing) and many tubes. Call Lin Robertson, KJ6EF, 1038 Turquoise #9, San Diego, CA 92109, (619) 488-3226, 9 AM to 9 PM 7 days.

Sparton Model 557 in working cond. Some small chips in blue glass and some mirror finish missing,

some split veneer. Trade for Chris-Craft or Century wooden boat. Boat need not run, but must not have major damage. Robert or Stephanie Varnes, 1953 S. Lumpkin St., Athens, GA 30606, (706) 543-1355.

AWA Review, Vols. 1, 2, 3, 6 . . . and now 7! $12.50 each postpaid. AWA, 44 E. Main St., Flemington, NJ 08822.

Western Electric amps 2A and 7A, appear in good cond. but w/o tubes. Will trade for interesting military electronics items. William Van Lennep, Box 211, Pepperell, MA 01463, (504) 433-6031.

Octogenarian selling **small collection** of early radios (crystal sets, etc.), headphones, Songbird radio tubes in original boxes, old books on radio, etc. Harold A. Perris, Lake George, NY 12845, (518) 374-8786.

Round radio chassis punches: Greenlee 11/16", ½", 1-5/32", Pioneer 5/8". All four $25, postpaid. Ken Greenberg, 4858 Lee, Skokie, IL 60077, (708) 679-8641.

Rider's Radio Manual Index for 1-15, reprint, $13 ppd; tube audio amp (chassis) 50W: Pritec 4270, Executone PB 350, 75 W; Muzak 975A, 50W; Muzak 950; $10 ea. plus UPS. Inverter, 32-V input, 115-VAC 60-Hz 100-W output, $30; B&K 960 transistor-radio analyst w/manual, $30. NIB vibrators, 2-V, 4-V, 6-V, sync. types, $2 and up - write needs w/SASE for quotes. Jim & Nadiene Farago, 4017 42nd Ave. So., Minneapolis, MN 55406-3528, (612) 722-0708.

Rider's TV 7, 9, 10 and 11, trade my extras for your Rider's TV 16, 17, 18, 27 and 28. Bob Smith, 14779 Kogan Drive, Woodbridge, VA 22193-3314.

Kennan 5 TRF battery set, untried but both audios OK, in exc. cond. $115. Many other radios, books & collectable tubes. Send 2 stamps for complete photo-list to Ron Boucher, Box 541 (OT), Goffstown, NH 03045, (603) 497-2988.

Old Time radio shows on tape cassettes. Catalog listing nearly 5000 shows arranged by category and title, $2. Herbert Parsons, Jr., Box 2284, Peabody, MA 01960.

Radio News, *Radio and TV News* and *Electronics World*, 1946-63, 166 issues $45 (pick up only); AC-DC radios w/service sheets: Trav-Ler 65-38 (hums) $12 + UPS, Sentinel 344 (plays) $16 + UPS. All items in good cond. L. Bogdan, 9348 Lake Rd., Corfu, NY 14036, (716) 599-3194.

Silent motion-picture projector, 35-mm, 1918, original cond., with lens. Roy Bucher, 719 Division St., Berlin, PA 15530.

National TRF plug-in coils - one complete set of 11 pairs, 190 kHz - 33 MHz. Look like FB-7 type, are about 55 years old, in good cond., and work in SW-3 and 58C receivers. Make offer. Arnold G. Wilson, N2EZ, 12 Princeton Rd., Audubon, NJ 08106, (609) 547-7884.

Schematics: 1920-70 radio, ham, TV, electronic organs, test gear, Canadian, misc., $5 PPD. For quotes on manuals send SASE. "If I don't have it, you probably don't need it." Alton Bowman, 4172 East Ave., Canandaigua, NY 14424-9564.

Schematics - $1.50 postpaid, 1920-52, radios only. Make and model no. must be known. Send requests to Kevin Ramos, Box 417783, Sacramento, CA 95841-7783.

WANTED

Philco mantel-clock chassis, Majestic 194 chassis, panels for Crosley 51A, 52, Ace 2B & V. Any Western Electric items. Marc Ingenthron, 9748 Outlook, Overland Park, KS 66207.

Philco advertising, signs, & clocks - Philco collector looking for same, in good-to-mint cond. Reasonable prices; have cash or trade items. Rick Yerke, Box 392, Moscow, PA 18444, (717) 842-4857.

Philco power transformer for Model 38-12, marked 32-7826, approx. 2-1/8 X 1-3/8, 300 V. Cunningham CX-345 and CX-380 balloon tubes. Lew Prince, Box 38, Sulphur Springs, AR 72768.

Philco audio output transformer, special, No. 327981-M. Push-pull primary, 8-ohm secondary, with tap for negative feedback, for Philco Model 41-315. Alton DuBois, Jr., 67 Peggy Ann Road, Queensbury, NY 12804.

E. H. Scott literature, esp. orig. issues of *Scott News*, printed 1929-46. Will trade 2 issues for any I don't have or will buy outright. Orig. Vol. 1, No. 2 *OTB* to complete my coll. Jim Clark, 1292 Starboard, Okemos, MI 48864, (517) 349-2249.

Scott: Contact with anyone who owns or knows about a Scott Special Communication Receiver. My interest is in historical documentation and preservation of these rcvrs. All correspondence kept confidential. John T. Meredith, Box 1070, Niceville, FL 32588-1070.

Delegate badge from the 1921 ARRL convention in Chicago. Paul Cristensen, N9AZ, 11142 Raley Creek South, Jacksonville, FL 32225, (904) 721-9111, 9 AM - 5 PM.

Documentation or other historical info regarding the WW II mil. radio SSR-5-A made by Philharmonic Radio ca. 1945. Any info on the history of the Philharmonic Radio Corp. in New York would be appreciated. Kevin S. Smith, 1751 Cherrytree Lane, Mountain View, CA 94040, (415) 857-3423.

Owner's manual for Webster-Chicago wire recorder Model #7 (RMA375). Copy OK. Also schematic & orig. microphone. Any prerecorded wire featuring big bands & entertainment from late '40s. Rider's Manuals Vols. 18 thru 21. Loretta Hausmann, KA3QBT, 6256 Montague St., Philadelphia, PA 19135, (215) 333-0116.

Lincoln Radio Corp. info: actual radios, brochures, anything. Also, any ex-Lincoln employees or descendants of William H. Hollister, please call or write. Help preserve Lincoln history. Don Hauff, Box 16351, Minneapolis, MN 55416, (612) 374-9739.

Old books, magazines, handbooks, *White's Radio Log*, first callbooks, old writings on radio, issues of *Radio* magazine. I pay shipping, please do not throw them away. Donald Boland, N1FYX, 28 Faulkner St., Malden, MA 02148, (617) 324-5362, Fax (617) 322-8412.

GE TV: Parts or junker set to complete a 1939 GE television Model HM226 (same as HM225). Need power-supply chassis; deflection-yoke assembly, audio output, vert output, horiz output transformers; knobs. Are any of these items in your junk boxes? Thanks! Jeff Lendaro, 1107 Logan St., Noblesville, IN 46060, (317) 773-3969.

Citizens Radio Callbook Mag. for 1920, 21 and 22. *Amateur Radio Callbook Mag.* (flying-horse cover) for 1925 and '26. Bob Arrowsmith, Box 166, Annandale, VA 22003 or collect (703) 560-7161.

Hammarlund sockets, receiving-tube ceramic, mfg in late '30s. Rectangular with corners cut off. Any welcome, but need octal, large and small 7-pin types. 50 or more General Radio banana plugs with 3/8" or longer 6-32 mounting studs for small transmitting coils. Harry Wells, AA6PP, 8538 Serapis, Pico-Rivera, CA 90660.

Zenith 6-volt DC radio 6B107 and Zenith remote speaker. General Electric portable radio 250. Rider's Volumes 15 and up. George Bonanno, 34 Charles St., Clifton, NJ 07013, (201) 746-5953.

Philmore crystal sets: "Little Wonder" (green, orange, red, rose) and early version, "Blackbird" late version, "Peerless," "Selective" early version and "vest pocket." Any other factory-made crystal set. Please make offer with your price. Many thanks. Erwin Macho, Ambrosweg 17/A/8, A-1230 Vienna, Austria.

Ernest Electric Radiophone Model V, schematic, literature, ad copy, etc. Copies preferred. Made by Ernest Electric Co., 4049 Easton Ave., St. Louis, MO. R. E. Hager, Box 301, Biglerville, PA 17307-0301.

ARRL Handbooks, 1st, 5th, 6th, 8th & 16th eds. for my collection. For sale: several 1940-to-date ARRL Handbooks plus other old books. LSASE for list. Several Hallicrafters S-38A-B-C-Ds $50. Bob Schafer, Box 442, Aumsville, OR 97325.

Crosley radios, TVs from 1920s to 1959. Other Crosley items. Michael Morrell, RT2, Box 5024, Williston, FL 32696.

Any bug with sheet-metal base. Early Mac-Key with brass nameplate. Please state cond., price. Tom French, W1IMQ, "The McElroy Collector," 120 Great Road, Maynard, MA 01754, (508) 897-2226.

Collins vernier drive, Collins speaker, E. F. Johnson milliammeter, Speed-X bug, Paragon RA-10/DA-2. Brian Roberts, 3068 Evergreen Rd., Pittsburgh, PA 15237, (412) 931-4646.

Collins eqpt for small public non-profit museum. Esp. need non-working sets to restore, like 75A-series rcvrs and 32V xmtrs. Will consider working or nonwkg sets. Early Collins xmtrs, esp. pre-WW II. Help preserve early Collins radio. Reasonable prices paid for nice sets; will pick-up within reas. distance. David Knepper, Box 34, Sidman, PA 15955, (814) 487-7468.

Keys, bugs, paddles. Will trade other keys or buy. Particularly looking for old or unusual keyer paddles. John Rehak, N6HI, 4035 E. Lavender Lane, Phoenix, AZ 85044-4681, (602) 759-8019.

Meters, with or w/o wooden cases, made by the Weston Electrical Instrument Co. of Newark, NJ. My father is 83 years old; retired from Weston in 1974 after 40 years of service. All letters will be answered. Thanks! Brian Rhodes, Box 241, Hackettstown, NJ 07840-0241, (908) 459-4583.

Pilot radios, any style, any model, any cond. Thanks! Bill Moore, 3049 Box Canyon Rd., Huntsville, AL 35803, (205) 880-1207.

Telegraph gear from the early days of spark and landline communications: cable keys, camelbacks, early bugs, large spark keys. Miniatures and pieces from oddball manufacturers welcome. Have a few trades. Gil Schlehman, K9DWY, 335 Indianapolis Ave., Downers Grove, IL 60515, (708) 968-2320.

Vintage frequency standards, including atomic, such as HP 5060, 5065, etc. Plan to calibrate my wavemeters! Will Jensby, W0EOM, 645 Giannini Dr., Santa Clara, CA 95051, (408) 296-6071.

Command-Set receivers, any cond. Not the usual BC-453s, but RAT-RAV series: CBY-46107 (9-13.5 MHz); CBY-46108 (13.5-20 MHz); CBY-46109 (20-27 MHz); R-112/ARC-5; O-4/ARC-5 calibrator. RAT/RAV octuple rack; MT-67/-ARC-5 or MT-75/ARC-5 quad racks. WECo D-150235 voice-operated relay. Ludwell Sibley, 44 E. Main St., Flemington, NJ 08822, (908) 782-4894.

Atwater Kent Models 10, 20C, 35 in restorable cond. AK horn speakers and good dynamic cone types. Will pay going market prices and cover all freight costs. Paul Jones, 11 Gaunt St., Newmarket 4051, Brisbane, Australia, (07) 3566219.

Service manual for a VHF Tempo One/Plus 2-meter transceiver made by Henry Radio, 1978; Western Electric literature, components, receivers, 14A amp. Need 2-205D, 2-239 or 264A or 26A and 300A tube. Tad Drogoski, N3JZQ, 507 Coal Valley Road, Jefferson Boro, PA 15025-3703.

Manuals for Heathkit IG-5280 and IT-5283. Also Precision tube tester 10-40. J. Cadrecha, 292 S. Prospect St., Burlington, VT 05401.

Hickok tube-test adapter #1050-127 for nuvistors; UTC PVM-3 output transformers; 211/VT4 tubes; 4-pin jumbo sockets for same; E. H. Scott AW 23 chassis, not working OK. Thanks to all who have written. Tony Ellis, 17 Odeon Ct., Baltimore, MD 21234, (410) 882-6190.

Bizarre wireless experiences without fear of ridicule! We are publishing a small article on STRANGE PHENOMENA and Old Wireless. We need your help! Strange sounds, sferics, ball lightning, weird transmissions, spark-induced sleep or dizziness, etc. Gerry Vassilatos, 52 Delmar Avenue, Staten Island, NY 10312.

TV/radio broadcast & film eqpt (WE, RCA, others): cameras, mikes & station "flags," consoles/mixers, amps, limiters, turntables, pickups, 16" transcriptions, recorders (tape, wire, disk), blank disks, "on air" lights, literature, speakers, tubes. Elaborate console radios (deco, fancy changers,etc.), Scott, McMurdo, etc. Choice items for trade/sale. SASE. Robert Van Dyke, 2 Squires Ave., East Quogue, NY 11942, (516) 728-9835.

Broadcast amplifiers and playback systems. Especially Western Electric, including theatre and telephone systems. Please call collect. Sumner McDaniel, 1 Edgewood Place, North Brunswick, NJ 08902, (908) 249-3738.

Rider's Manuals 6, 7 and 15 thru 23. Photos of cabinet for floor-model Colonial AC-31. Will pay for photos. Steve Kalista, 9 Maple Drive, Jim Thorpe, PA 18229, (717) 325-4120.

Manual or copy and any info on Nems-Clarke 200-2 panoramic adaptor. Thanks! Bill Springer, K5CGR, 923 Nelda, Houston, TX 77088.

McMurdo Silver Masterpiece III pwr supp. amp. and speaker; Airline 62-197 (Wells-Gardner 6F); Silvertone 300 (ch. 132.054) case with or w/o chassis; International Kadette Model 41 case; manuals for Munston CA 1510 signal generator and H. H. Scott 420A sound analyzer. George Harris, 3212 36th St., Lubbock, TX 79413, (806) 795-5604.

Pocket-size transistor or tube radios from U. S. or Japan. Toy crystal radios. Eric Wrobbel, 20802 Exhibit Court, Woodland Hills, CA 91367, (818) 884-2282 phone or fax.

Tech manual for BC-348J, -N, -Q; radio-repair troubleshooting books; also radio & comm repair courses by National Radio Institute and Cleveland Institute of Electronics. Alan Mark, Box 372, Pembroke, MA 02359.

RCA SSB-1 Mark IVB - manuals, schematics, history, etc. Any info appreciated. David Hark, N8GMQ, Box 201, Shepherdstown, WV 25443.

Desperately need **Federal #31 RF coil** and loop antenna for Radiola 25. Will pay your price. Help me out, guys!. Bill Noro, 126 Evaline St., Pittsburgh, PA (412) 371-2988

Radio brochures, flyers, catalogs, pamphlets. Ross Litrenta, 1 Wilton Rd., Eastchester, NY 10709, (914) 337-7176.

Chassis for GE Model K-63. Junius Bailey, W5FTW, 1002 Reeves St., Abilene, TX 79602, (915) 695-6006.

HRO-5 coil sets: 7-14.4 MHz (JB), 14-30 MHz (JA), 0.9-2.05 MHz (E), 0.48-0.96 MHz (F), 50-100 kHz (J), 100-200 kHz (H), speaker for HRO-5, "S" meter for HRO. Charles Rhodes, 3906 Quisenberry Drive, Alexandria, VA 22309, (703) 780-0719 (home), (703) 739-3850 (work).

Low-frequency coil sets for the National HRO-5, especially "H." Ted Althof, KE3AL, 504 East 9th Ave., Tarentum, PA 15084, (412) 224-0905.

BOOK REVIEW:

RADIO PARTS CATALOG

Large format, 42 pages, $2 postpaid, from "Playthings of the Past," 9511-23 Sunrise Blvd., Cleveland, OH 44133

Many sales listings and catalogs covering radio artifacts and parts have passed over my desk in recent years but few with the variety of this one. It is almost like an old-time Allied Radio catalog. Here are some of the offerings:

- most early receiving tubes;
- replacement transformers (power, audio, output) and chokes;
- original switches, jacks, headphones, etc.;
- replacement rheostats, RF coils and variometers;
- a large selection of old radio magazines dating back to the early '20s.

Gary Schneider, the proprietor, must have haunted hundreds of auctions and flea markets to acquire this huge inventory of replacement parts. His catalog is worth its price as an information source. Highly recommended. [BK]

NIKOLA TESLA ON HIS WORK WITH AC CURRENTS

Edited by Leland Anderson

Large format, 237 pages, soft cover, $40 plus $2 shipping, from First Century Books, Box 2001, Breckinridge, CO 80424

The book consists of an annotated transcript of a pre-hearing interview with Nikola Tesla conducted by his legal counsel in 1916. The material contains a thorough history of Tesla's pioneering investigation of alternating currents as applied to wireless transmission. Covered is his work at the Grand Street laboratory through the establishment of the huge Wardencliffe plant on Long Island.

The transcript reveals a near-genius who occasionally makes questionable statements, revealing a difficult personality. One is struck by the tragedy of a brilliant man who could have had a comfortable old age, but who instead died penniless and friendless in a Manhattan hotel room.

Editor Anderson is the long-time Tesla investigator who wrote "Tesla vs. Marconi: Priority in Invention of Radio" (AWA Monograph No. 4) and edited "John Stone Stone on Nikola Tesla's Priority in Radio and Continuous-Wave Radiofrequency Apparatus" in AWA Review Vol. 1.

Numerous illustrations and drawings. Recommended. [BK]

UNITED STATES ARMY IN WORLD WAR II - THE TECHNICAL SERVICES - THE SIGNAL CORPS: THE EMERGENCY THE TEST THE OUTCOME

By Dulany Terrett et al.

Hardbound, 351, 621, and 690 pp.; 1956, 1957, and 1966 respectively, Center of Military History, U. S. Army. From U. S. Government Printing Office, Washington, D. C. 20402, (202) 783-3238, cards accepted. Prices and stock nos.: 008-029-00048-2 ($17), 008-029-00049-1 ($14), and 008-029-00075-0 ($19) respectively.

Why review a series of books that first appeared 25+ years ago? Well, it's the definitive work on its subject, it's still in print, and there is no known previous review. This series, used in conjunction with the Report of the Chief Signal Officer - 1919, is the Army analog of the History of Communications-Electronics in the U. S. Navy.

As the titles suggest, the work is divided timewise. The Emergency covers the period up to Pearl Harbor: the somnolent, budget-starved Twenties and the trouble-ahead Thirties when resources began to be available to build a modern Signal Corps to supply the emerging needs of the Army and Air Corps. The Test records the frantic early years of the war (Dec. 1941 - July 1943), when the scramble was on to build two globe-circling communications systems (Army Command and Administrative Network and Army Airways Communications System), crash-develop radars, refit the Army with new tactical radios, and build wireline facilities under "impossible" conditions (Alaska Highway, 2020 miles; Iceland, 1350 mi.; Calcutta-Kunming, 1950 mi.). The Outcome carries on past V-J Day to the 1946 moon-radar experiment.

Technical topics covered include the rise of crystal-controlled FM radios, the huge improvement in field telephone networks from introduction of multiplexed spiral-four cable (CF systems) and tactical radio-relay systems (AN/TRC-1 et al.), the whole Army and Air Forces radar program (from frenzied attempts to copy everything the British had devised, Chain Home included, to sophisticated microwave sets like the SCR-584), and the replacement of long-haul manual CW operation by radioteletypewriter systems. A 37-page appendix outlines specific systems and their functions. There is coverage of the Signal Corps' role in photography, motion-picture production, and even pigeonry. The struggle to build up training bases and a global supply system is included. A recurring topic is the rush to get civilian industry to produce more and more equipment, with military quality, of types unknown before the war. The relationship between the Air Corps and the Signal Corps, its communications-electronics supplier, is covered: usually strained, never resolved.

This work was written by professional historians, as opposed to trained electronics people, so the discussions of technology are a bit odd in places. It is a little wordy - a good line editor could have squeezed the size down by 10%. Being a military history, it necessarily covers nonelectronic factors like Tables of Organization and Equipment.

Equipment collectors are warned that the text talks more about complete "SCR" systems than "BC" components. Thus the owner of a BC-474 transceiver will learn little directly about it. However, knowing from Fred Chesson's AWA Review 6 listing that the BC-474 was part of SCR-288, the discussion of the SCR-288 will be highly informative.

Despite official sponsorship, these volumes seem to be realistic history, relating both goofs and glory. As an example, there is related a sad episode. In late April 1942, the Air Corps asked for

14,400 of the obsolete SCR-183/283 aircraft radios in addition to an existing program of 38,000. Western Electric and Philco contracted to build the bigger order and went to it, presumably on the usual three-shifts-a-day, win-the-war basis. In June the airmen cancelled the whole project. WECo and Philco scrapped their work-in-process. Then in July the Air Corps decided it wanted some sets after all - 3230 - and in November 8000 more. No wonder procurement was a difficult business!

These books seem to be known to the military-electronics community, and they turn up in used-book stores. However, the price is so low that getting the set new makes sense. [LAS]

MUSEUM NEWS

TELECOMMUNICATIONS MUSEUM, ADELAIDE

Antony Bell

In the May 1989 *OTB*, Mr. Don Nordenholt wrote an article "Australian Radio Museums and Collectors," an account of a trip he made to Australia with his wife in February 1988. He made very complimentary comments about the Telecommunications Museum in Adelaide. It is regarded as perhaps the best museum of its type in the southern hemisphere and amongst the better worldwide. However, with the advent of private competition to the monopoly previously held by its owner, the Australian and Overseas Telecommunications Corporation (formerly Telecom Australia), the latter has had to become competitive. As a result, the museum is about to close.

While there is some talk of a Technology and Science Museum in Adelaide, incorporating the Telecommunications Museum, I believe this museum will be some time away due to the huge debt the present government has got this state into.

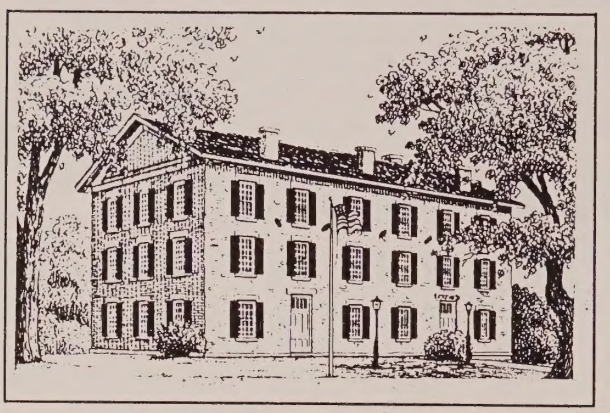
However, if any AWA members are visiting Adelaide, the South Australian members of the Historical Radio Society of Australia (H. R. S. A.) would be delighted to show some of their private collections. Initial contact may be made throught this address: Antony K. Bell, President of the Historical Radio Society of Australia Inc. - South Australia Branch, P. O. Box 1162, North Adelaide, S.A. 5006, Australia; telephone (08) 269 4095.

MUSEO JULIA DE LA RADIO, BARCELONA

AWA member Juan Juliá Enrich, EA3BKS, reports the establishment of a private museum, the Museo Juliá de la Radio, near Barcelona. He invites collectors to visit. The address for inquiries: Ap. Postal 81, 09470 Sant Celoni, Spain. From looking at a brochure describing the collection, it represents quite a comprehensive selection of early crystal and tube receivers of Spanish, American, Italian, British, Dutch, German, and French make; transistor and novelty sets; literature, military-amateur comm gear, microphones, tubes, and recorders.

Visitors enjoying part of the museum. Sr. Juliá is at right center.

THE MUSEUM



AWA ELECTRONIC COMMUNICATION MUSEUM

Location: Village Green, Rtes. 5 & 20, Bloomfield, New York
Hours: May 1 through October 31: Sunday, 2-5 PM; June 1 - August 31: Saturday, 2-4 PM; Wednesday, 7-9 PM. (Closed Holidays)
Group tours by appointment: 716-657-7489
Museum telephone: 716-657-6260
Amateur Station: W2AN
FREE ADMISSION

SEASON'S-END REPORT

We can safely report another successful year for the Museum, with record attendance Sunday afternoons during the summer. As in the past, visitors varied from Cub Scouts to such experienced personnel as WQXR's chief engineer. A small display of WW II military gear (BC-348 receiver, BC-375 transmitter) signaled the start of a new exhibit for '93. The Museum Committee again thanks Chuck Bliley and his guides for maintaining the openings with minimum problems.

Annex activity includes a new tube room housing material from the original "barn" museum. The goal is to cover four walls and ceiling with receiving and transmitting tubes. The area will exhibit 160 brands of 201A tubes and, by coincidence, a like number of differing tube cartons. Of interest will be a large display of foreign items, TV camera tubes, early traveling-wave tubes, and lasers.

A new security system has been installed at the Annex. This complements the Museum's dual alarm system. Additional protection against theft is the fact that the most valuable pieces are easily identified.

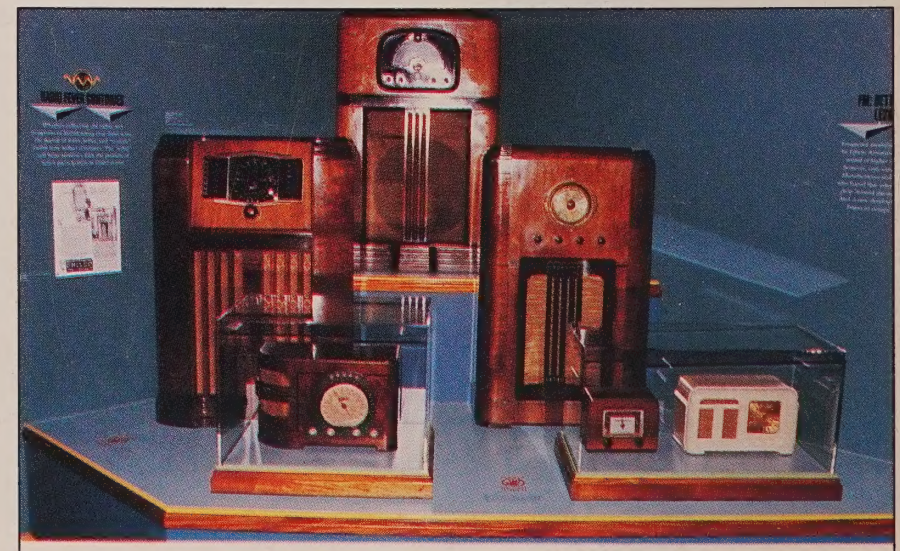
The Museum's large collection of broadcast receivers on loan to Rochester's Strong Museum returned in July after an 18-month exhibit. This display and the "Empire of the Air" TV production have given our museum great publicity.

RECENT DONATIONS

Equipment recently contributed to the Museum can certainly be classified as diverse. The items include a collection of early light bulbs with unusual bases, from Australian member Fin Stewart. Joe Pavek's son Don, of Pavek Museum fame, gave the Museum a rare de Forest Interpanel set and a WW I SCR-68 aircraft transceiver, both in mint condition. The Museum was then offered an original, well preserved Quaker Oats crystal set, unusual considering its construction and age. A gift which might have been turned down was an old black-and-white television receiver. Further questioning of the donor found the receiver to be a "mirror-in-lid" set. Do I have to tell you it was accepted and is now in the Annex! Dexter Deeley picked it up, at some cost to his car upholstery, and got it on-site.

NEW GEAR IN AWA MUSEUM

Leland Anderson; Duncan Brown, K2OEQ; Sanford Danziger; Bro. Patrick Dowd, W2GK; Cyril Edmonds, WA2WWO; Joe Fleming, W7YI; James Ferguson, K2AKH; Glen Fuller, N2EXL; Tom Galbreath; Clyde Haehnle; Hugh Kline; Fred Linn, W9NZF; Wm. Moneysmith, W4NFR; Bill Plimpton, W2IXH; Mani Pires; Fin Stewart; Dan Servatius, N2HVT; Strong Museum; Hugh Turnbull, W3ABC.



Thirties radios from AWA at the Strong Museum. *Photo: Gil Magraw*